

Flight, December 17, 1910.

FLIGHT

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

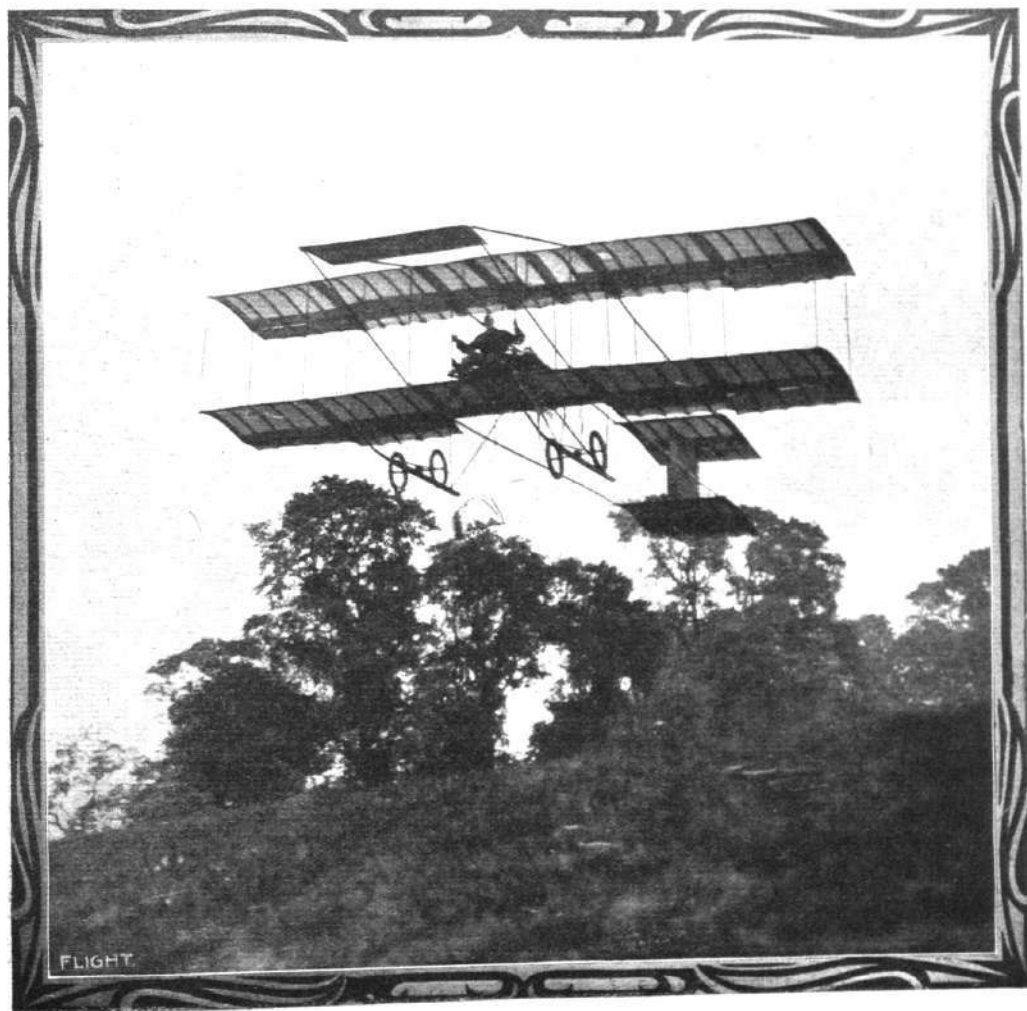
OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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DECEMBER 17, 1910.

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A REMINISCENCE.—Mr. Claude Grahame-White, on his Henry Farman machine, flying from Ranelagh for a tour over Barnes Common and Putney.

THE NEED FOR ALL-BRITISH "ENCOURAGEMENT."

A LETTER we have received from one prominent in the world of aviation is well calculated to give all readers of *FLIGHT* furiously to think. "Cannot you do something" we are asked, "to obtain greater assistance for English flying men and all-English flying machines? Just at the moment we are well off, and the result is there are half-a-dozen men making a good show, but what is going to be the state of things next year? . . . There is absolutely nothing for the all-English machine though there is £10,000 which everybody is anticipating will be taken out of the country . . . We want £100,000 to get into the pockets of the flying men during the next twelve months, and then you will see that English brains are as good as foreign, and we will lead the French instead of following behind them. We want a very large number of moderate sized prizes, open for various competitions, so that there is a good chance of the money being spread about pretty evenly amongst the flying men, and we want them arranged so that the competitions will be extended throughout the whole year and interest kept continually alive."

With these sentiments we associate ourselves wholeheartedly. Admittedly, of course, we hold a brief for the science and industry of aviation, particularly British aviation; but it is not for the comparatively narrow reason that would be implied in this confession that we find ourselves in accord with the views of our correspondent. Except in the case of the fanatically conservative, it would be hard to find anyone to dispute that British aviation is—or should be—a national movement and that it should be encouraged as such. It may not be of the urgent importance of naval construction, though neither we nor anyone else dare pretend to prophesy with any claim to certainty what the near future may bring forth; but what is certain is that this country can no more afford to be left behind in the race of nations than it can in the development of warships. How is an advance to be made and the proper place assured in the forefront of progress? The whole answer to this question is contained in the suggestion of our correspondent. What is urgently wanted is money—money to be devoted wholly and solely to the British flying machine, and British flying man.

In order that the British movement should be given the best opportunity to develop itself, it is first of all necessary that the attention of the whole world should be concentrated upon this country as the most important centre of aviation. We have seen how this can be done, in the interest that was excited by the competition for the *Daily Mail* prize; and already the same international prominence has been guaranteed for next year by the further prize of like amount that has been promised—not to mention the further fortunate fact that the Gordon-Bennett contest is also due to be competed for in the United Kingdom. But outside of the British Michelin Cup, our correspondent is quite right when he says that there is nothing exclusively British promised for 1911 in this country and, so far as the portents tell us, there is not likely to be in spite of the fact that, being Coronation year, there ought to be *everything* doing. With the flying meeting a discredited form of popular entertainment, owing to the huge financial losses sustained by the promoters, it is hardly likely that 1911 will see them revived, and we are therefore forced back upon some other method of exciting public interest. For that we cannot express any deep sorrow, for we have

never held the opinion that the "circus performance" flying meeting does any permanent good to the movement. To our way of thinking, one *Daily Mail* competition does more real and lasting good than a dozen "meetings" such as have proved such financial failures; and after all there are a thousand minor ways wherein similar performances could be inaugurated throughout the country.

Now, we have always given the *Daily Mail* the very fullest credit for its public spirit and far-sightedness in providing two such magnificent prizes as those which its proprietors have put up. But there is another and a business side to this question. The advertisement which the *Daily Mail* has secured for itself and its enterprise has probably been worth all and more than the sum it paid for it. We do not say this in any spirit of criticism—far from it—but it is necessary for us to put it that way in order to point the moral we have in mind. Up to the present, the *Daily Mail* has paid £10,000 for one of the finest advertisements that ever fell to the lot of a business concern, and we are confident that its owners would admit that it was worth the money. Thereby two things have been achieved—the one already named; the other is that British aviation received a fillip which was of incalculable benefit to it, so that everyone concerned should be satisfied. Now the point is that if it is worth the while of one wealthy concern to provide money for what we feel quite justified in describing as a dual purpose, surely there must be others who would benefit themselves and the movement by doing somewhat likewise.

But, having agreed that money should be found for providing a number of small prizes, there always remains the question of who is to provide the wherewithal? Both the Royal Aero Club and the Aeronautical Society have well performed their exclusively allotted parts in conducting contests, and in furthering knowledge respectively. But in this connection we would ask: What has become of the Aerial League? This body was instituted as a "patriotic" association, whose avowed purpose it was to see that the movement was encouraged with the wider public in such a way that this country should not be left behind by her rivals; but we confess, reluctantly, the difficulty of seeing what national service it has yet performed to encourage British aviation. Here is a chance for it. The municipalities of the country should be canvassed to a man and asked to put up prizes (they need not be large in amount) for local performances—say £100 for the first British airman on a British machine to reach a predetermined spot in the locality from a distance of a hundred miles without an intermediate stop during a specified week. And the semi-selfish side of the advertising value accruing for, let us say, the Moonbeam Soap £1,000 prize should be driven home to the interested parties until they can see that they would be doing a public service and would also be getting value of their own for it.

As things are there is too much of a disposition to look upon flying as being in the stage that motoring was in 1896 and to think that history will repeat itself in that the movement will develop itself from within at the expense of the private owner. The case is much more analogous to the state of affairs existing in the thirties, when the pioneers of self-propelled traffic were forced after a gallant fight against terrific odds to give up the attempt to bring the movement to practical account. Let it be seen to that history does *not* repeat itself in this particular.

THE "MAYFLY"—THE FIRST IRISH BIPLANE. AND HOW SHE WAS BUILT.

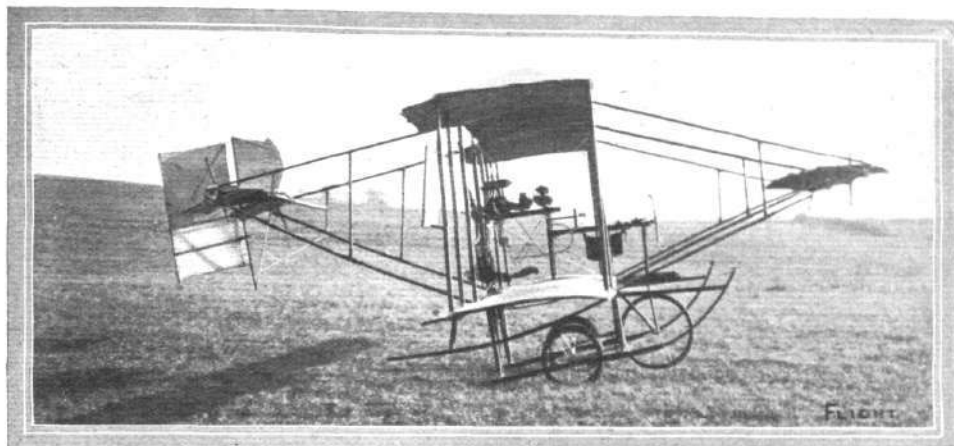
By LILIAN E. BLAND.

IN view of the considerable interest which has been taken in my biplane, which has gradually been evolved from a glider, I have, at the request of the Editor, written the following description of it:—

As the principal dimensions of the machine are given in the scale drawings, it will be unnecessary to repeat them here. The wood used for the main spars is ash, the curve of the wing tips being steam

removed in one piece either with or without the engine, which is held in place by four bolts.

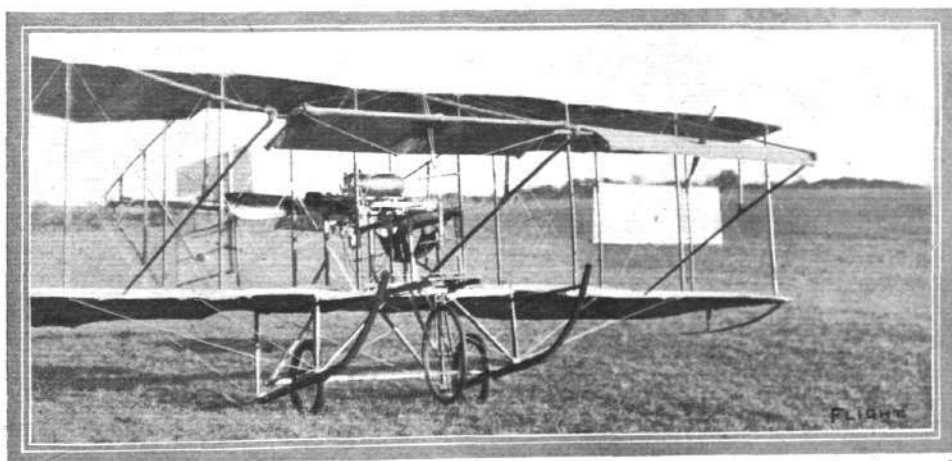
The controls consist of a bicycle handle bar which rocks and turns. Turning the handle to the right raises the right hand elevator and depresses the left, the connecting wires being crossed. The elevators are connected to the horizontal tail planes, which



THE "MAYFLY."—This side view shows the machine as she now is, but in the new tail Miss Bland contemplates fitting, the fin in front of the rudder will not be used.

bent. The ribs and stanchions are of spruce, the outriggers of bamboo, the skids of ash, and the engine bed of American elm. This engine bed is really a separate chassis set across the main spars to which it is clipped; stays run from the rear spar to the chassis, which is also wired out to the upper and lower spars, so that it would be impossible for the engine to shift unless the whole

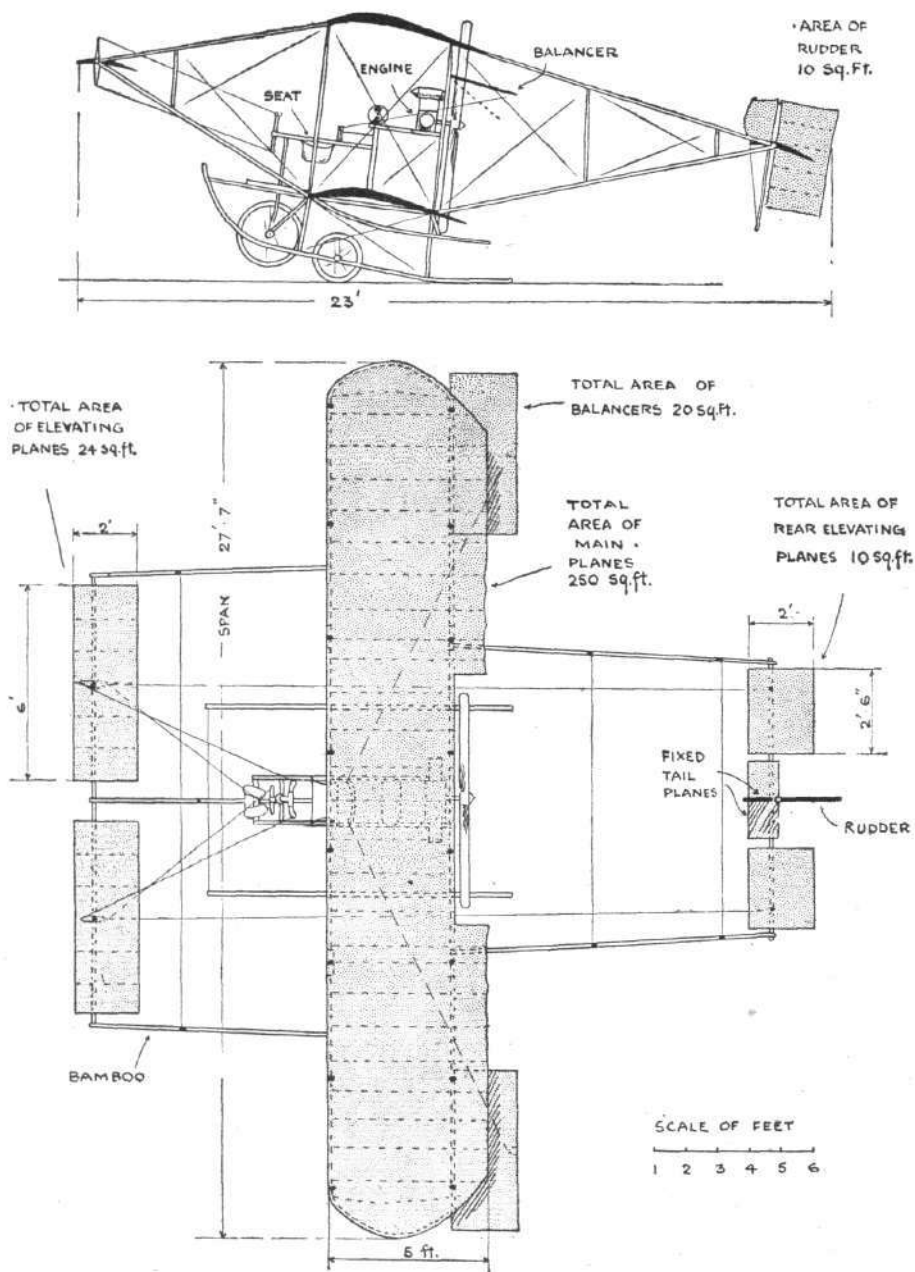
work in the opposite direction to the elevators; all controls are double, wire and strong waterproofed whipcord. The balancing planes, which are hinged to the rear stanchions, are controlled by the back of the seat, leaning to the right pulls down the right hand balancer and *vice versa*. The vertical rudder is worked by pedals. The engine controls consist of a butterfly valve which regulates the



THE "MAYFLY."—View of the front of the biplane, showing how one elevator rises and the other lowers. In this photograph also the wiring of the wings to the skids is noticeable. The angle of the machine on the skids is 6 degrees.

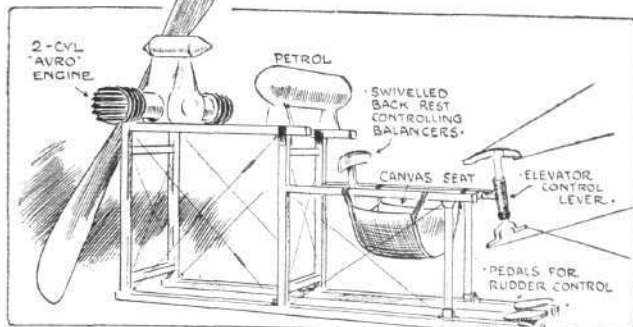
machine were wrecked. Additional strength is also given to the wings by the wiring. The chassis carries the tank and the pilot's seat, the latter being slung by four straps. In front of the seat, which is enclosed on all sides so that it is impossible to fall out of it, is the bar for the elevator control. The whole chassis can be

petrol supply, an air throttle, and a lever to the magneto, while when starting one cylinder is cut out. All these controls may sound complicated, but in practice they are quite simple to work, and I think it is a great advantage to have the engine and aeroplane under complete control, as it is not always necessary to run the engine all out.



THE "MAYFLY."—Plan view and side elevation to scale.

When the engine starts, the draught from the propeller lifts the tail and the tip of the skids off the ground, and the machine balances on the two wheels; the third wheel in front only comes into action over rough ground, and is to prevent the going on to her nose; it answers admirably, as my practice ground is ridge and furrow, which on hunting

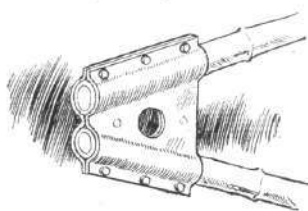


THE "MAYFLY."—Sketch showing the general arrangements of the detachable framework containing the power plant, &c.

principles I take at a slant. I have wasted much time in trying to run the machine on ball-bearing wheels and spindles, fitted with various springs, rubber bands, &c., none of which were satisfactory. The spindles were always bending or breaking, and the wheels are now rebuilt on to 7 in. hubs, which run on the axle. The axle is clipped to the skids, and the only spring is that afforded by the Palmer tyres.

The construction of the machine is more or less of the usual type, but the trailing edge and wing tips are more flexible. Originally steamed ribs were used, but were later discarded, as they did not keep their proper curve; the present ribs are cut out solid to the correct curve for the lower surface of the rib, and are given a flatter curve on the top, while they are bored out for the sake of lightness.

The double surface of fabric is laced on, a method which allows one to make any alterations without spoiling the fabric, and also it can be tightened up when it stretches.



The "Mayfly."—Detailed sketch of the outrigger pivot.

I should not advise any amateurs to commence building aeroplanes unless they have plenty of spare time and money, but there are nevertheless many people who like myself have the time, but lack the necessary £ s. d.

As the result of my experience I am certain that the only way to build an aeroplane cheaply is to put the best of everything into it. Eyebolts, I think, should be hand turned with good solid heads, and, needless to add, wire-strainer eyes should be strong, and the threads properly cut. Castle nuts or patent locking washers of some kind should be used to prevent the nuts working loose with the vibration. I may say that I got all my wire, bolts, &c., from Messrs. A. V. Roe and Co., and was very well satisfied. The actual cost of a biplane is not very serious, as sufficient good wood (in the rough) costs about £3 or £4. With regard to the fabric, I now use unbleached calico, which is 6 ft. wide and costs 9d. a yard. The running gear will cost anything from £6 upwards. The engine, as everyone knows, is the most serious item. My own machine has a 20-h.p. engine, and the expenses have not yet amounted to £200, although the machine has been practically rebuilt, has had two propellers, several pairs of skids, three different tails, &c. It should be borne in mind, how-

ever, that this means doing all the work oneself, which is not altogether a disadvantage.

My first propeller was broken by some wires snapping from the vibration of the engine, and when the second propeller had had some narrow shaves from the same cause I tied all the wires back, so that when it snapped it could do no further harm; the break was always at the bend on the loop. Unless the wire is silver plated it has to be continually cleaned to keep it free from rust, and as many wires are difficult to get at to clean it is a good plan to paint them. I use a good black enamel for all the clips. All the woodwork is copal varnished to protect it.

Bamboos should be carefully selected, the section of the cane being thick and round, and one generally has to sort through 20 or more canes to find one good one. The bamboos also get a coat of varnish, the ends have an air hole drilled, before the plug is driven in. A piece of cycle tube with one end flattened to make the necessary clip, is slipped over the bamboo, and riveted on. The other clips, &c., are made of different gauges of hoop iron or steel.

The tank and carburettor float are placed across the span of the machine, so that the fore and aft tilt does not interfere with the petrol supply when the tank is getting empty; tanks are made now with two cocks leading to the tube, which gets over this difficulty where the fuel is fed by gravity.

As to the actual flying of a machine, I am not a good enough pilot yet to give much advice, and my own machine is the only one I have been on. She rolls considerably until she gets up speed, and I imagine all machines do the same. As this is the natural action of the beast when one sits still, it is not necessary to try and balance the roll. If the balancing planes fail to right the machine quick enough, the vertical rudder can always be relied on to do so. One can learn a great deal by watching good pilots. Unfortunately there are none in Ireland at present, but I have been fortunate in seeing Farman, Paulhan, and Latham, all masters of the art.

Certainly it is the finest sport in the world, and well worth all the hard work, but there is still plenty of room for improvement both in the aeroplanes, engines, and propellers. I imagine one of the best types of aeroplane would be a tandem monoplane, in which the wings would be used for balancing and elevation.

To sum up the various points one has to settle before starting the construction of a machine:—

Firstly.—A place to fly it in. Bad ground is waste of time and takes much longer to learn on.

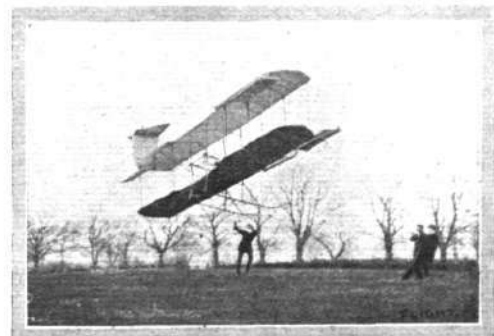
Secondly.—The engine, if of low h.p., the aeroplane must be light and have large area to weight.

Thirdly.—The placing of engine and pilot, and whether main planes will carry all the weight, &c.

Fourthly.—To draw out every detail to scale, and if trying an original design, to make a good-sized model, and see if any new point in controls or design is going to work as it is intended.

Fifthly.—Design the machine so that it can be easily taken to pieces for transport, &c. (by turning the skids round, my machine will wheel along any road when the outriggers are taken off).

In conclusion, I should be glad to get orders either for gliders or full-sized machines, and provided I can use my own designs, I will guarantee that the machines will glide or fly, that the work and quality will be of the best, but the engine and propeller must be reasonably efficient, otherwise it is only waste of time.



The "Mayfly" in its original form as a glider, soaring in a 12-m.p.h. breeze.

AEROPLANE SILHOUETTES FROM THE PARIS SHOW.

THE BREGUET BIPLANE.

CONSTRUCTED by Louis Breguet at Douai. Fuselage and framework of steel and wood. Planes double-surfaced throughout. The main planes are connected by four stanchions placed a short distance back from the leading edge. Well known for its weight-lifting powers. On one occasion M. Bréguet carried five passengers beside himself, the total weight of the six persons being 420 kilogs. Beside the one described, a racing model with only 26 sq. metres bearing surface, and fitted with a higher-powered engine, is also made.

General Dimensions.—Bearing surface, 38 square metres. Length, overall, 9.20 metres. Span of upper main plane, 13.20 metres; of lower main plane, 9.90 metres. Wings of normal type are 1.70 metres broad.

Seating capacity.—Two seats, placed one behind the other.

Engine.—50-60-h.p. 5-cyl. semi-radial R.E.P. motor. Normal revs., 1,000. Any motor fitted.

Propeller.—Breguet, of two blades. Diameter, 2.90 metres. Geared down, variable pitch. Normal revs., 600.

Chassis.—Three wheels, one centrally in front of other two (which are each double); short skids in front of each wheel; front wheel is steerable by means of ordinary control wheel. The entire aeroplane is suspended on these three wheels, there being neither skid nor wheel under the tail.

Tail.—Cruciform monoplane tail, mounted on universal joint.

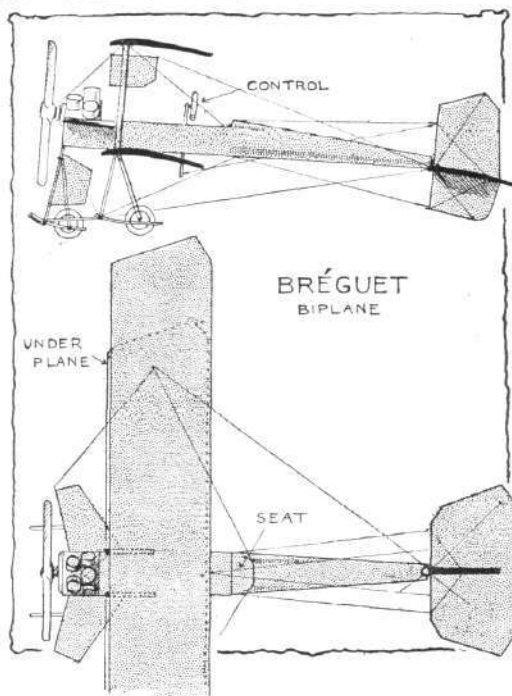
Lateral stability.—By the flexing of the trailing edges of the main planes.

Weight.—About 475 kilogs. complete with motor.

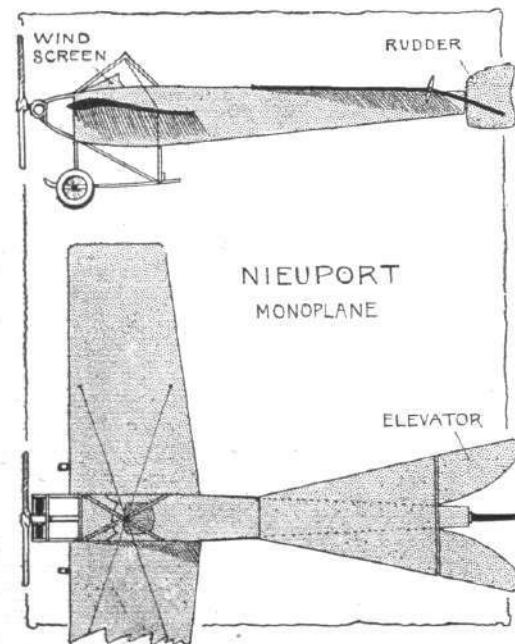
Speed.—85 kiloms. an hour.

System of control.—By a wheel placed on a lever. Rotation of the wheel steers the machine. Backward and forward movements of the entire column elevate and depress the aeroplane, and a sideways movement to the right or left depresses the opposite wing in either case.

Price.—With 50-60-h.p. R.E.P. motor, 30,000 francs.



THE NIEUPORT MONOPLANE.



FRENCH-BUILT monoplane. Made its first appearance at the Rheims Meeting, 1910. Planes double-surfaced throughout. Entire fuselage is covered in with fabric. One of the lightest and most efficient aeroplanes on the market.

General dimensions.—Bearing surface, 14.9 metres; length overall, 7.50 metres; span, 8.40 metres.

Seating capacity.—One or two seats.

Engine.—20-25-h.p. 2-cyl. horizontal opposed air-cooled Darracq motor. Normal revolutions, 1,200. The 5-cyl. 40-h.p. Anzani or the 50-h.p. Gnome can be fitted at an increased cost, as shown below.

Propeller.—Chauvière Intégrale. Diameter, 2 metres. Pitch, 1.20 metres. Effective revs., 1,200.

Wheels and skids.—Two wheels connected by a flexible leaf spring. A single skid is placed centrally curving forwards and upwards.

Tail.—Non-lifting fin extending to elevator, which is in two parts to allow single rudder placed centrally to work freely.

Weight.—Complete with engine, 250 kilogs.

Lateral stability.—Maintained by flexing the trailing edges of the wings. The wings are connected by a patented arrangement by which one wing automatically alters the curvature of the other wing when under undue pressure, thereby maintaining stability to some degree.

Speed.—75 kiloms. an hour.

System of control.—The flexing of the wings for the maintenance of lateral stability is performed by two independent pedals, each controlling one wing. A wheel control actuates the rudder, and the backward and forward movement of a lever works the elevator.

Price.—Two-seater, with Darracq 20-h.p. motor, 18,000 francs. Two-seater, 40-h.p. 5-cyl. Anzani, 22,000 francs. One-seater, 50-h.p. Gnome, 24,000 francs. Two-seater, 50-h.p. Gnome, 26,000 francs. Any engine can be fitted if required.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 13th inst., when there were present:—Mr. R. W. Wallace, K.C. (in the Chair), Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Prof. A. K. Huntington, Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. C. F. Pollock, Mr. Stanley Spooner, and Harold E. Perrin, Secretary.

New Members.—The following new members were elected:—

Clifford B. Harmon, Lieut. Wildman Lushington, R.M.A.,
Lieut. C. A. M. Sarel, R.N., and Wilfred Harold Simpson.

New York Aviation Meeting.

The Extraordinary Conference of the *Fédération Aéronautique Internationale* to consider the protest of Mr. C. Grahame-White in connection with the Statue of Liberty Prize, will be held in Paris early in January. The following Sub-Committee has been appointed to deal with the matter on behalf of the Royal Aero Club:—

Mr. Mervyn O'Gorman. Mr. J. T. C. Moore-Brabazon.
Prof. A. K. Huntington. Mr. C. F. Pollock.

Aeronautical Reserve.

At the suggestion of Mr. C. Grahame-White, the Committee of the Royal Aero Club is again taking up with considerable activity the question of bringing about the formation of an Aeronautical Reserve Corps, which it is hoped will be the nucleus of a very wide movement throughout the whole of Great Britain.

The following Special Committee has been formed to formulate a detailed plan of action so that the Government authorities may have something definite and tangible before them for their approval. Suggestions to this end will be welcomed by the Committee of the Royal Aero Club:—

Mr. C. Grahame-White, Mr. Cecil S. Grace, Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Prof. A. K. Huntington, Mr. Griffith Brewer, and Mr. Stanley Spooner.

International Aero Exhibition at Olympia.

The International Aero Exhibition held by the Society of Motor Manufacturers and Traders under the auspices of the Royal Aero Club, will take place at Olympia, opening on Friday, March 10th, 1911, and terminating Saturday, the 18th.

Full particulars can be obtained on application to the Exhibition Manager, Society of Motor Manufacturers and Traders, Maxwell House, Arundel Street, Strand, London, W.C., or the Secretary, Royal Aero Club, 166, Piccadilly, London, W.

In connection with the Exhibition it is proposed to organise an exhibit of model flying machines. Space will be given free, and the Royal Aero Club will erect suitable stands and provide the necessary attendants. In order to partly cover this expense a charge of 10s. will be made for each model exhibited. It is proposed to award Medals and Cash Prizes.

Gordon-Bennett Aviation Cup.

The Cup, having been won this year by Mr. C. Grahame-White, the nominee of the Royal Aero Club, the race for 1911 will be held in England. The exact date and place will be announced later.

An Extraordinary Conference of the *Fédération Aéronautique Internationale* will be held in Paris early in January to determine the special regulations to govern the contest for 1911.

Each Club forming part of the *Fédération Aéronautique Internationale* has the right of challenging the holder, the Royal Aero Club, and such challenge must be received before March 1st, 1911.

The Committee of the Royal Aero Club will select the three competitors and reserves representing the United Kingdom. Intending competitors are requested to notify the Secretary on or before February 28th, 1911, of their willingness to compete if chosen. Applications must be accompanied by a cheque for £20, the entry fee, which amount will be returned should the competitor not be selected.

Candidates must be members of the Royal Aero Club.

Baron de Forest £4,000 Prize.

The Committee of the Royal Aero Club has decided that, provided the competitor has duly given 48 hours' notice of the first attempt

and has made proper arrangements with the official observer to be present at the start, such competitor will be deemed to have duly complied with the latter part of Rule 9 as regards giving 24 hours' notice of subsequent attempts.

SPECIAL REGULATIONS.

a. Competitors must have their machines ready for examination as soon as possible after sending in their entries. In the event of any alteration being made after the examination such alteration must be at once notified to the Secretary.

b. Competitors must, before starting, produce a certificate from the maker certifying that both machine and motor are of British manufacture in accordance with the rules.

c. The complete machine must be examined before the start and the competitor must give a written undertaking that such machine complies with the regulations.

d. Competitors will be required to pay the out-of-pocket expenses of officials in connection with the verification of the machine and the observing of the start. A deposit of £10 must be paid prior to the verification of the machine, and any balance after payment of the expenses will be refunded the competitor.

British Empire Michelin Cup.

Intending competitors are again reminded that the competition for this year closes on the 31st inst. Full particulars can be obtained from the Royal Aero Club. The best performance so far recorded is by T. Sopwith, 107½ miles.

Presentation to the Rolls Memorial Library.

The Smithsonian Institution of Washington, U.S.A., has kindly presented the following books to the Rolls Memorial Library:—

"Experiments in Aerodynamics," by S. P. Langley.

"Internal Work of the Wind," by S. P. Langley.

Rolls Memorial Fund.

Members who have not yet sent in their contributions to the above Fund are requested to do so as early as possible. By limiting individual subscriptions to the sum of 10s. the Committee hope they will receive the support of all members.

It has been decided that the Memorial shall take the form of an Aeronautical Library at the Royal Aero Club, to be called the "Rolls Memorial Library."

Contributions of books to the "Rolls Memorial Library" will also be greatly appreciated.

A list of subscriptions received to December 7th was published in the last issue, and the following have since contributed up to the 14th inst.:—Charles Davis, Lady Jenkins, and Vivian A. Simon. *Per Aero Club de France*: Alfred Le Blanc.

Eastchurch Flying Ground.

For the convenience of Members, the best train is the 9.45 a.m. from Victoria, arriving at Queenborough 10.55. At Queenborough change to the Sheppey Light Railway for Eastchurch, which is ½-mile from the flying ground.

Railway Arrangements.—The following reduced fares have been arranged with the railway company for members visiting Eastchurch:—

1st Class return, 8s.; 2nd Class, 6s. 6d.; 3rd Class, 5s.

Tickets available for one month from date of issue.

Members desiring to avail themselves of these reduced fares are required to produce vouchers at the booking offices. Vouchers can be obtained from the Secretary of the Royal Aero Club. Trains leave Victoria, Holborn, or St. Paul's.

Aviation Lantern Slides.

The Royal Aero Club have now acquired a large collection of lantern slides dealing with aviation, and members can hire these at a fee of £1 1s. for a period not exceeding three days. They include all the latest machines and pictures taken at aviation meetings in England and abroad. Application for hire should be made to the secretary.

HAROLD E. PERRIN,
Secretary.

166, Piccadilly.

PROGRESS OF FLIGHT ABOUT THE COUNTRY.

NOTE.—Addresses, temporary or permanent, follow in each case the names of the clubs, where communications of our readers can be addressed direct to the Secretary. We would ask Club Secretaries in future to see that the notes regarding their Clubs reach the Editor of *FLIGHT*, 44, St. Martin's Lane, London, W.C., by first post Tuesday at latest.

Aeronautical Society of G.B. (53, VICTORIA STREET, S.W.).

By the courtesy of Dr. Glazebrook, Director of the National Physical Laboratory, arrangements have been made for the Society to visit the Laboratory on Saturday, January 28th, 1911.

The train leaves Waterloo at 1.45 p.m. for Teddington. Reduced third class fares will be available provided there is a sufficient number of members in the party. Members who desire to go are requested to notify the secretary as early as possible, but in any case not later than January 1st, 1911.

Aeroplane Building and Flying Soc. (8, MANCHESTER ST., W.).

THE Society, after a tough fight with the British climate, has at last succeeded in building a hangar sufficiently large to shelter their two machines, which are now at Kensal Rise awaiting completion. The Society is probably the first that has ever built a hangar without outside help, and the members feel very proud of the result of their efforts.

On December 6th the chairman, Mr. J. D. North, was invited to give a lecture on aviation to the members of the Marylebone Camera Club. A short history of flight was given, and then followed brief descriptions of a number of different machines, illustrated by lantern slides. Views of the Rheims Meeting of 1910 and the Paris Show were also shown, and to finish up several photo slides were shown illustrating the progress of the A.B. and F.S. Among these were views of the gliding hill at Kensal Rise, the workshop, parts of the glides, and a section of an uncovered wing showing methods of construction.

Birmingham Aero Club (165, HAMPTON STREET).

THE annual meeting of this club will be held on January 8th at the club at 8 p.m. The balance-sheet for the year will be put upon the notice board a fortnight before this date, and anyone wishing to obtain information respecting any item in it will be allowed to examine the books. It is particularly hoped that those who have dropped out of the club during the year will attend the annual meeting.

Advantage will be taken of the "cross-water" flying at Edgbaston Reservoir on December 27th to obtain a good photo of all the club members for insertion in the year-book.

East London Aero Club (37, TUNMARSH LANE, PLAISTOW, E.).

No doubt it will be interesting to our East London readers to know that the above club are arranging a most excellent programme for the winter months. A course of lectures is being prepared which should prove most beneficial to members anxious to acquire a technical knowledge of aeronautics, and a workshop will be opened for the use of members. The secretary wishes to state that if full advantage is to be derived from the programme, prospective members should join at once.

On Saturday last the above club held its first general meeting at Stratford. Mr. F. Small presided over a good attendance, and Mr. C. F. Longford delivered a very interesting lecture upon "Model Aeroplanes and Their Construction." This was followed by a discussion which was taken part in by a good many of those

present. At the close of the meeting Mr. E. Sissons, the honorary secretary, outlined the future programme of the club, and also referred to the progress which had been made up to the present.

Kite and Model Aeroplane Assoc. (27, VICTORY RD., WIMBLEDON)

THE arrangements for the winter session are almost complete. The lectures arranged are: Mr. V. E. Johnson, on January 9th, "The Gyroscopic Control of Aeroplanes"; S. F. Cody, Esq., "From Kites to Aeroplanes"; and C. Marconi, Esq., of wireless fame, "Wireless Telegraphy with Kites and Aeroplanes." Applications for seats should be made to the hon. sec. as soon as possible, as already many applications have been received.

Paddington and Districts Aero Club (2, EDBROOKE ROAD, W.).

At the present time three full-sized machines, all of different types, are being constructed by various members of the club, and as the accommodation at the old workshop has proved insufficient, fresh quarters have had to be sought. The three machines have now been removed to Windsor Place, Harrow Road, W., where the work of erecting them is proceeding apace, and is being watched by other members of the club with keen interest.

Scottish Aeronautical Society (185, HOPE STREET, GLASGOW).

THERE was a large attendance at the lecture held at the rooms in Elmbank Crescent, Glasgow, last Friday night, to hear Mr. F. Norman deliver his lecture on "The Building of an Aeroplane." Mr. Norman, who has an aeroplane with which he is practising at Hamilton, described the variation in design of spars and struts, joints, sockets, fittings, bracing, and methods of construction, as well as the different systems of control. In the course of his work in connection with the Lanark meeting Mr. Norman had an opportunity of examining practically every machine which was present, and, in view of his own experience, his lecture was a most interesting one.

The next lecture is on Wednesday next, when Col. John A. Sillars will speak on "Aeroplanes Up to Date," while the succeeding one will be by Mr. Duncan Bell, of Edinburgh, on "A Flapping Wing Machine," on January 13th next.

Yorkshire Aero Club (HOTEL METROPOLE, LEEDS).

AT the recent general meeting it was agreed that "a Junior Section of the Yorkshire Ae.C. be formed, open to members under 18 years of age." Members of this section will have the same privileges as the senior members, with the exception of voting at general or special meetings. The annual subscription to this section has been fixed at 5s.

SCHOOL AERO CLUB.

Arundel House School Ae.C. (15, ARLINGTON ROAD, SURBITON).

ON Wednesday, the 7th inst., the club record for longest flight was broken by Cyril Ridley at Sandown Park, Esher, his improved model, the "Ridleyplane," No. 34, accomplishing a perfectly straight flight of 871 ft.



"Aeroplane Patents."

SUCH is the name given to a volume of some 90 pages which has been brought out by Messrs. Constable and Co., and of which the author is Mr. R. M. Neilson. Its scope is essentially such as to render it quite valuable and useful to every inventor whose attention is concentrated upon aeronautic developments just at the present time, and who may not already be *au fait* with the doings of others as he would like to be and as he ought to be in order to work efficiently himself. In scope the work in question is essentially one that is quite possible, but is only possible in the relatively early days of any quite new industry, for it endeavours in a comparatively short space to give the gist of all the more important British patents bearing on aviation that have been taken out up to now. By way of introduction, moreover, 13 pages are devoted to bringing before the novice just those elementary facts which it is all-important for him to know with reference to the procedure of patenting an invention and the pitfalls to avoid. The price of the book is 4s. 6d. net, and there must be thousands of readers of *FLIGHT* to whom it is well worth that expenditure

whether they happen to be seeking advice as inventors, or whether they are merely taking an interest in studying the aeronautical problems on which a great deal of thought is now being focussed by pioneers.

An Aeroplane in Hampshire.

A GREAT deal of interest has been taken in an aeroplane which has been built in the neighbourhood of Winchester, with a view to its competing for the Baron De Forest prize. Mr. A. C. Hawkins, who is the owner of the machine, has recently returned after a lengthy visit to New Zealand, where he, in company with Mr. Bertram Ogilvie, who has also come to England, spent some time in studying various problems in connection with aeronautics. The machine has three main planes, with a propeller in front, while at the rear is an elevator and a rudder. Although but scanty details of the machine are available at the present moment, it is stated that the longitudinal stability is automatically regulated by the action of the wind upon the planes. The aeroplane will be piloted in its trials by Mr. Ogilvie.

HONOURING MR. CLAUDE GRAHAME-WHITE.

IN response to the official notification in *FLIGHT*, a very representative number of flying men and keen helpers in the cause of aviation foregathered at the Royal Aero Club banquet, offered to Mr. Claude Grahame-White last week at the Carlton Hotel, to give the guest of the evening a hearty welcome upon his return from his very successful visit to the United States. Incidentally the International Aviation Trophy presented by Mr. Gordon-Bennett was formally placed in his keeping.

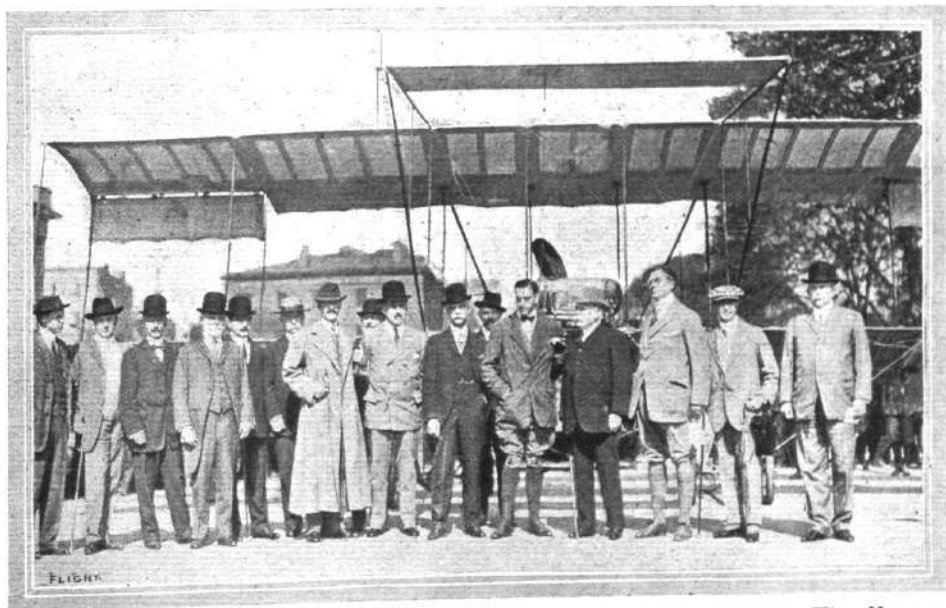
The gathering took the form of a pleasant little Club dinner, and the forty or fifty members who were present were like a happy family honouring one of their number. The whole thing was of an informal character, and naturally after the loyal toasts had been disposed of, the toast was proposed by Mr. Roger Wallace, the Chairman of the Club, who presided, and very gracefully responded to by the hero of the evening.

Many of the points Mr. Grahame-White made were possibly in the knowledge of most of his listeners, but the major part of it being history, it very greatly added to the interest attaching to his speech, as coming from the man himself who made that history. The details of his work at Belmont Park, leading up ultimately to the formal protest in connection with the Statue of Liberty prize, were gone into in detail, and corroborated in every way the opinion which appears to prevail that he was undoubtedly, under the rules, entitled to be awarded the prize. Mr. Grahame-White was very emphatic, however, in regard to the suggestions that had been made that he regarded the Americans as bad sportsmen. Quite the contrary, he maintained, was the fact. Of course, there were poor sportsmen in America the same as there were in Great Britain and every other country in the world, but taking those associated in aviation in America, his verdict was distinctly in favour of their being sporting to a degree. Any troubles which had arisen at Belmont Park or otherwise he was inclined to attribute more to want of experience in such an entirely new undertaking as aviation. That being practically the Americans' first international meeting, it was hardly to be wondered at that slips and little episodes which might at the moment appear extremely unpleasant, occurred which some have been attributing to bad faith rather than want of experience. Great Britain had learnt her lesson in the past with her international meetings at Bournemouth and at Lanark, and no doubt the United States had

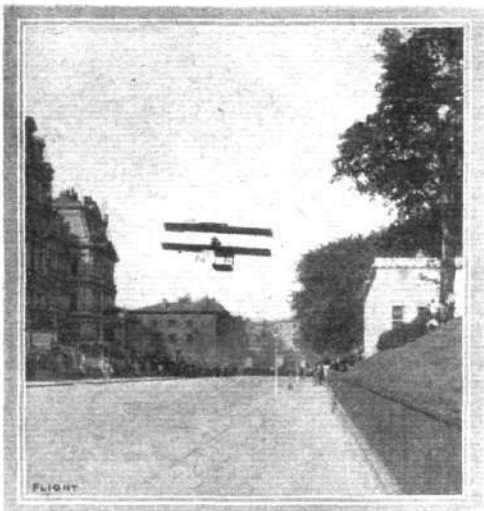
also by their international meeting gained experience which at any future gathering would bear fruit.

Dealing with the Gordon-Bennett Cup Race, it was very gratifying to hear the praise meted out by Mr. Grahame-White to the house of Blériot for the manner in which they rushed through and shipped the racing monoplane to New York in response to a cable from Mr. Grahame-White, enabling him thereby to compete on behalf of Great Britain and bring back the Cup for contest in this country in 1911. When Mr. Grahame-White arrived in America, although he was nominated as one of the British representatives, he had very little inducement to compete, seeing so little chance of securing with his machines this "blue ribbon" of the aviation world, by reason of the superior speed monoplane of the leading French competitor, M. Leblanc. It was only at the last hour, as it were, that he determined to make a try to uphold British prestige, and when it is understood that this Blériot racer did not arrive at Belmont Park until 36 hours before the opening of the competition, the efforts successfully put forward by Mr. Grahame-White as representing the Royal Aero Club may be the more generously appreciated by his fellow-countrymen. The machine had then to be assembled, tested and tuned up, and again adverse weather for all practical purposes prevented Mr. Grahame-White from trying his machine before he actually started in the race. Once or twice round the course was all he was able to manage, yet although never having before been within touch of one of the 14-cyl. Gnome engines or a Blériot racer, he without the slightest hesitation took the air, and made the magnificent fight against the world for the Trophy. Very generous was Mr. Grahame-White in his almost affectionate reference to the fine work and the ill-luck of his French competitor, M. Leblanc. It almost made his hearers feel that as a sportsman he would not have been a little bit sorry had he taken second place to M. Leblanc under the circumstances. It was just the luck of war, and he was first in distance just about by a "neck," and Leblanc was beaten, but in speed magnificently in front.

Amongst those present at the banquet was Mr. Clifford B. Harmon, one of the, if not the leading, amateur aviator of America, and, through his recent association with him in America, the close friend of Mr. Grahame-White. To Mr. Moore-Brahazon was



Mr. Claude Grahame-White and the Military Chiefs of the Government when he called at the White House, and the War and Navy Departments in an Aeroplane.—Reading from left to right: Richard R. Sinclair, Capt. Barr, Major George O. Squier, U.S.A., Brig.-Gen. James O. Murray, U.S.A., Capt. H. B. Wilson, U.S.N., Commissioner Johnston, Commodore John Barry Ryan, Brig.-Gen. A. W. Greeley, ret., Maj.-Gen. Leonard Wood, Gen. Oliver, Gen. James Allen, C. Grahame-White, Admiral Dewey, Clifford B. Harmon, Sidney McDonald, Maj.-Gen. James A. Bell.



Mr. Grahame-White paying a visit on his Henry Farman to the White House and the War and Navy Departments, Washington, during his recent trip to America.—This is probably the most daring and successful practical flight so far accomplished.

entrusted the privilege of proposing a toast in his honour, which task he very tactfully accomplished, incidentally emphasising the sportsmanlike character of our American cousins, and holding that any little troubles of their meetings were undoubtedly due to want of experience. A recital of the aviation work done and the trophies won by Mr. Harmon brought his appreciation of our American visitor to a happy conclusion.

Every inch a sportsman himself, Mr. Harmon was loud in his praises of the unselfish and splendid work done by Mr. Grahame-White, and his remarkably sportsmanlike methods in his every action in America. He instanced his generous behaviour in, without hesitation, when he (Mr. Harmon) had smashed up his own machine at the Boston meeting, giving him (Mr. Harmon) the complete run of his aeroplanes, enabling him thereby to carry off a large number of prizes open to amateur flyers. It was no question of money, as Mr. Grahame-White absolutely refused altogether to take one penny in return for the use of the machine. It was just the action of one brother aviator to another, and that had instantly cemented such a firm friendship that he had come over to Europe with Mr. Grahame-White out of pure companionship and desire to be associated with him in his triumphal re-entry to England.

In his concluding remarks Mr. Grahame-White was particularly keen upon the formulation of a pet scheme which he has had in mind for some time, viz., the formation of a British corps of

flyers, and he was very enthusiastic in his appreciation of the manner in which the movement had spread in America, where it had been taken up very strenuously by leading members of the Government, and looked like becoming a very powerful factor in the future protection of the United States. Mr. Clifford B. Harmon also expressed very enthusiastic views upon the same subject, and it transpired that it was mainly through the arrangements made by Mr. Harmon whereby Mr. Grahame-White made his historical journey across Washington, landing in front of the White House and the Army and Navy Departments of the United States Government. The photograph which we give this week of this remarkable incident, and the group of Government officials and others upon the same occasion, unquestionably gave an enormous fillip to this growing movement, which had already shown very strong signs of intense vitality in the United States. Mr. Grahame-White strongly advocated the formation of an aeronautical reserve in Great Britain, saying that he was prepared in every way to place himself and his machines at the complete disposal of the Government; and there is little doubt that if some workable basis for an aerial corps could be arranged between the Royal Aero Club and the Government departments, in accordance with the suggestions which have for some time been put forward by the Club, that some movement of the sort should materialise to the benefit of this country and aviation generally within a very short period of time. The fact that already the Royal Aero Club have placed at the disposal of the British Naval authorities two of the latest up-to-date aeroplanes on their Eastchurch flying grounds, which offer has been without reservation accepted by the Navy Department, goes far to show the undoubtedly favourable attitude which those responsible for this section of our forces are inclined to take towards the movement.

Amongst the more active flying members of the Club present were Mr. Cecil Grace, Mr. Astley, Mr. Sopwith, Mr. Greswell, Mr. J. T. C. Moore-Brabazon, and Mr. Mortimer Singer, who, everybody was glad to find, was completely recovering from his bad accident at Heliopolis, and hoped shortly to re-enter the flying arena and continue his early work as a pioneer.

Aerial League Gold Medal for Mr. Grahame-White.

At an afternoon reception held by the Aerial League at the Waldorf Hotel on Tuesday, Field-Marshal Earl Roberts presented Mr. Claude Grahame-White with the gold medal of the League in appreciation of his efforts in the advancement of British aeronautics. The guests were received by Lady Massie Blomfield and Lady Bam, while Sir William Hall Jones, High Commissioner for New Zealand, occupied the chair. In presenting the medal, Earl Roberts described it as a mark of admiration for the manner in which Mr. Grahame-White, who only learnt the art of flying in France last year, had borne himself as an aviator from the time of his gallant attempt in April last to win the London to Manchester prize to the time in October last when he won the Gordon-Bennett Trophy. Mr. Grahame-White, in replying, expressed his thanks to the Aerial League for their medal and the reception, and said he was especially glad to have won the trophy, because it would mean that the greatest aviation meeting of the year would be held in Great Britain in 1911. Once more, as in his speech at the Aero Club banquet, Mr. Grahame-White paid a tribute to M. Leblanc for his splendid effort on behalf of France, and again urged the formation of an aeronautical reserve such as had been established in the United States. On the motion of General Arbutnot, seconded by Mr. Roger Wallace, K.C., a hearty vote of thanks was accorded to Earl Roberts for presenting the medal.

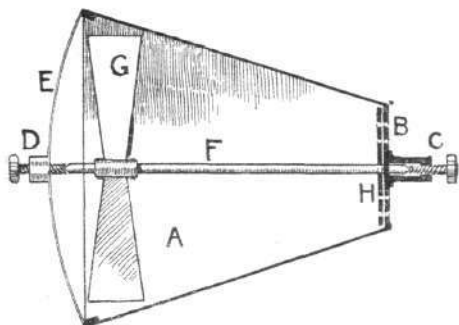


Mr. F. Straight on top of one of the hangars at Brooklands during the past season timing aviators in the air.

SPEED-ALARMS FOR FLYERS.

SOME MORE COMPETITIVE DESIGNS FOR OUR £5 PRIZE.

[29] I enclose a design for an aeroplane speed whistle. The explanation is as follows:—A is a funnel, having at one end a disc, B, and adjustable screw bearing, C, and at the other end a bearing, D, on its support, E. In the bearings runs shaft, F, which carries at one end a windmill, G, and at the other a disc, H.

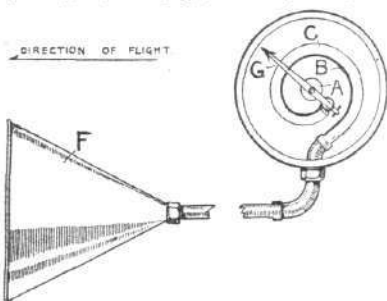


Discs, B and H, are pierced with two or more concentric rings or holes, the radii of corresponding rings being the same in both discs. The bearings must be adjusted so that the discs run in contact without appreciable friction. The higher the speed of the aeroplane the higher is the rate of revolution of the windmill and consequently the higher is the note.

Halifax.

E. RAMSDEN.

[30] May I submit the enclosed design of a speed alarm for competition for the £5 prize which you have so generously offered. The great point about my apparatus is that it is already invented, in the form of a steam pressure gauge, and will therefore require very little experimentation to be brought to perfection. This aerial speedometer, for such it may be called, consists of a small cone, similar to a miniature talking machine trumpet, and, as I stated before, a sort of steam pressure gauge. The cone, F, is fixed to the aeroplane with the opening facing the direction of flight, in a position where it may meet an undisturbed body of air; the air received in the cone is then transported down a tube, connected to the said cone, as per diagram, to the gauge, which is placed by the aviator.



The mechanism of this gauge consists of a very delicate tube, C, made of rubber or goldbeater's skin; inside this there is a weak steel wire spring, B, whose natural position is as shown in the plan. The air which is forced into the gauge-tube has a tendency to work the tube into the straight, like the toy which is sometimes found in a Christmas bonbon, which, when blown into, stretches out into an elongated body, but as soon as the pressure of air is released rolls itself up again. But to return to the speedometer. When the tube uncurls itself it takes a needle, G, with it, moving the pointer along a scale denoting miles per hour; the scale is omitted from the diagram, as it can only be decided upon by experiment. At A there is a very delicate spring, for the purpose of keeping the needle in tension with the gauge-tube.

An alarm might easily be arranged on my apparatus by making the needle, when it registers a certain speed which is deemed too fast for the aeroplane, complete an electrical circuit, and thus cause

a bell to ring. The electric bell arrangement need only weigh about 5 ozs., for the necessary current of electricity could be obtained from the aeroplane engine's accumulator or magneto. On the plans, E is a metal angle tube, to which the rubber or goldbeater's skin tube is attached. The speed alarm is drawn at a scale of about half and the cone one-third actual size.

In the event of this apparatus being attached to an aeroplane with a tractor, allowance would have to be made in the scale.

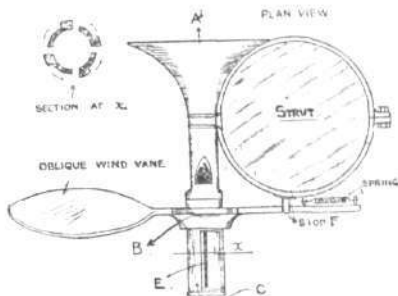
Bexhill.

DUDLEY G. O. HISCON.

[31] A bell-mouthed whistle, A, is clipped to a convenient vertical strut on the aeroplane, and carries on its rearward extension a rotating sleeve, C, to which is fixed a lever arm, B. One end of the lever arm, B, carries an oblique wind-vane, and the other is connected to a tension spring.

The extension of the whistle barrel behind the whistling orifice has four narrow longitudinal slots, E, placed at equal distances around its circumference, and the outer sleeve, C, has four wide slots corresponding with these. Clearly, so long as the four narrow slots remain uncovered there is free egress for all the air entering the bell-mouth without any considerable volume being forced through the whistling orifice and the alarm is therefore silent.

The vane on the lever-arm, B, faces obliquely forwards and upwards, and therefore the pressure of the air upon it when flying will force it downwards against the pull of the spring. As the arm, B, is carried down it rotates the outer sleeve, C, upon the whistle barrel until the limit of safe speed is reached. At this point the



air pressure upon the vane will have become so great as to force the arm, and consequently the sleeve, C, round upon the barrel until the four narrow slots are closed and the whistle comes into action. A stop, F, prevents the arm rotating further, and so passing the danger-point should speed still further increase.

In designing the above, the following requirements have been kept in view as essential for a device of the kind: Simplicity; freedom from rapidly-moving parts; the necessity that the alarm shall be positively sounding or entirely silent (a whistle commencing with a low note at safe speeds and rising as the danger-point is reached would be likely not to be heard among the other noises).

This requirement is met in the present arrangement by making the slots very narrow, say, $\frac{1}{4}$ in. wide only, so that a very small movement of the covering-sleeve makes the difference between an alarm signal and silence.

A further desideratum is that there shall be a minimum of parts that can go wrong, and in the event of failure the alarm shall sound at once.

This also is provided for, because the only detail that could well fail would be the spring, and should this break, the arm immediately falls to the alarm position, and the whistle will sound as soon as there is sufficient air entering the funnel.

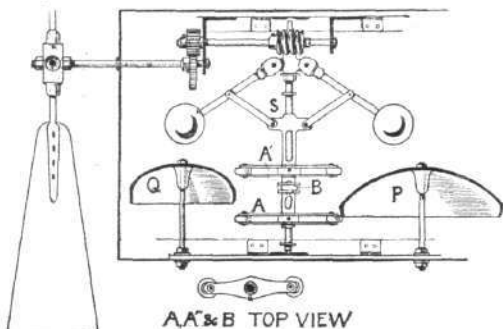
Birmingham.

G. BOOCOCK.

[32] This instrument is worked by a four-bladed metal propeller with adjustable blades. The boss is a casting with four sockets projecting radially, into which the blade-arms fit, where they are held at the required angle by set-screws. The rotary motion of the propeller is imparted to a vertical shaft by means of gearing with a reduction of 10 to 1.

On the vertical shaft are pivoted a pair of centrifugal balls, which, when rotated at sufficient speed, raise a sleeve, S (which slides on the shaft to which they are pivoted), which revolves at the same speed as the balls.

The instrument is set for an aeroplane with a maximum safe speed of 70 m.p.h., and a normal highest speed of 60 m.p.h. There are two bells provided, one to indicate each speed: a low-pitched bell to indicate 60 m.p.h., and to continue ringing until 70 m.p.h. is reached, then a high-pitched bell to start ringing, and the low-pitched bell to cease. The high-pitched bell will continue ringing however high the speed rises, and until it drops below 70 m.p.h.



The method of working is as follows:—

At the lower end of the sleeve, S, is fastened a striker, A, similar to that used on an ordinary cycle bell. The two rings at the ends of the striker have $\frac{1}{4}$ inch play, being thrown out to their full extent by centrifugal force, and giving inwards when striking the bells.

The two bells are of special shape; the low-pitched bell, P, having its rim sloping under, $\frac{1}{8}$ inch, so as to increase the volume of sound as the striker travels up it. The high-pitched bell, Q, has a cylindrical rim.

When the aeroplane is travelling at 50 m.p.h. or less, the sleeve, S, rests on a collar on its shaft, and can drop no further. When the speed of the aeroplane rises to 60 m.p.h. the striker, A (according to rough calculations), comes in contact with P, and as the speed rises, travels up it, gradually striking it harder, and thus producing more sound until the aeroplane reaches 70 m.p.h. By this time the striker, A, will have reached a sufficient height to just strike Q. It does not cease to strike P immediately that it begins to strike Q, but rings both for a very short period, at the end of which time it will have been raised to a point on the bell P, where the bell curves sharply away. Thus, directly it has passed this point, A will ring Q alone. Then it will gradually be raised until it is well on to Q, and the upward motion of the sleeve is arrested by a collar on the vertical shaft.

Thus there is no period after the speed of the aeroplane has risen above 60 m.p.h., when no bell is ringing, until the speed drops below 60 m.p.h. again.

We think two bells sufficient, but more could easily be fitted, if necessary, only it must be remembered that the more bells that are employed, the harder it is to distinguish one from another.

The bells could be made to ring at various speeds by screwing them up or down, and by altering the angle of the propeller-blades. In our calculations we have taken the pitch of the propeller as 3 ft. Of course, different aeroplanes would want instruments made to cover their own ranges of speed. This would be effected by gearing the propeller in various ratios with the centrifugal arms.

We think it necessary to have a sound quite distinct from the "too fast" alarm to indicate a dangerously low speed, as apart from a different note. This we obtain by causing P and Q to be rung alternately.

The instrument is set for an aeroplane with a minimum safe speed of 50 m.p.h. The alarm is effected by having two strikers, A' and B (similar to A), placed at right angles to each other on S, and above A.

In order that the low-speed alarm shall sound at 50 m.p.h., it is necessary that when S is in its lowest position the striker, B, shall strike P, and that the striker, A', shall strike Q. It would not be possible, however, for B to reach a position low enough to strike P before it had struck the bell, Q, on its way down, which, of course, would falsely indicate a speed of 70 m.p.h. or over.

Therefore, to avoid this, P is so placed that its rim is $\frac{1}{8}$ in. nearer to the axis of S than is the rim of Q. In that case it is possible to make B of such a length that on its way down, as the sleeve drops, it will pass by Q without ringing it, whereas directly it reaches P it will start to ring it.

The fact that P is nearer the axis of S than is Q does not in any way affect the working of A, as the play of its rings is quite enough

to compensate for this. Thus P and Q will indicate a speed of 50 m.p.h. and under by ringing alternately with each other.

The whole instrument is encased in aluminium, and is of streamline form. One side is made to hinge at the back, and is fastened by catches at the front. The casing should have large holes in it so as to allow the sound to escape, as otherwise it would be but dimly heard.

If necessary a couple of clips could be affixed to the instrument to fasten it to a convenient spar, if possible near the aviator's head.

The actual framework with the bearings, &c., should be made of strong strip metal riveted together.

We think that a ringing noise for the alarm is best, as it is most unlike the noises caused by the aeroplane or motor. Also the instrument does not require the aviator to have a musical ear, nor should it work out excessively heavy, nor should it offer much resistance to the air.

Hampstead.

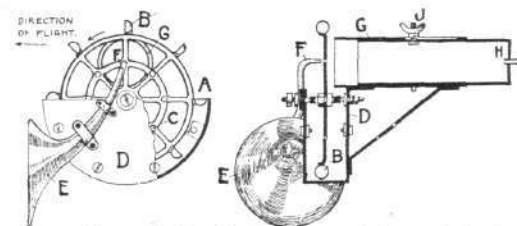
R. M. HILL and G. T. R. HILL.

[33] I beg to submit another speed-alarm for your prize offer. This has the advantage of having only one moving part. It is based upon a well-known principle of acoustics, namely, that tubes of a certain length resound to a certain note called the fundamental note of the tube. I append a rough calculation showing how the speed depends upon the length of tube.

The apparatus consists of a 3-in. wheel, A (made of sheet metal), carrying 8 cups, B, B, &c., and having 8 holes, C, C, &c., in it; the wheel runs in adjustable pivot-bearings in a trough-like case, D. To D is fastened (1) a funnel, E, from which a pipe leads to an air-jet which comes opposite to the holes, C, C, &c.; (2) a tube, G, made up of two sliding-sections held together by a winged nut, J, and adjustable in length, having a scale marked on it in m.p.h. (for setting).

Everything, excepting bearings, nuts, &c., is of brass, and nickel plated. The action is as follows:—

The rush of air against the concave cups, B, B, &c., causes the wheel, A, to revolve, its peripheral speed being nearly equal to the speed of the aeroplane. The air blowing into the funnel, E, blows a jet on the ring containing the holes, C, C, &c., and a siren note will be given off, whose pitch varies with the speed. At a certain speed the fundamental note of the tube is reached, and there is a



very great increase in the volume of the sound, the note being then very shrill and distinctive. A small tube, H, is let in at the end of the tube, G, because it is experimentally found that this would greatly increase the sound.

According to rough calculations, the tube should be 4 ins. long to resound at 80 miles on hour.

Calculation for finding length of tube for certain speed:—Let speed be V. Let diameter of wheel = d'' . Let number of holes = n . Let frequency of note be F. Then, assuming V to be the peripheral speed of the wheel (actually less), we have $F = \frac{Vn}{\pi d}$.

For a speed of 80 m.p.h. we have:— $F = 16 \times 8 \times 7 \times \frac{1}{4} \times 4 = 1,108$ vibrations per sec., or about two octaves above middle C (256).

Also, if S be the velocity of sound in air, l be the length of a tube closed at one end, it is known that $l = \frac{S \times 4}{F}$ (formula).

Now, S is known to be 1,100 ft. per sec.

\therefore we have $l = \frac{1100}{1108} \times 4 = 4.35$ ins.

\therefore if the tube, G, is set to be 4.35 ins. long, it will resound when a speed of 80 m.p.h. is reached.

S. Norwood.

O. F. MARSTRAND.

An Indian Prize.

In connection with the aviation meeting to be held at the United Provinces Exhibition at Cawnpore, the Elgin Mills Co. have offered a prize of £100. This will be given to any officer of the Indian Army or British Army in India who is an amateur, and succeeds in flying from the Polo Ground round the Fort and back.

SOME INTERESTING EXPERIMENTS WITH PLANES.

By C. J. L'ESTRANGE MALONE, R.N.

UP to the present one can almost safely say, notwithstanding the spectacular flights being daily carried out, that the theory of flight is altogether in its infancy.

Several works have been written on the subject by well-known experts, but the majority of them differ widely in their opinions, although their fundamental principles may be identical.

So far few experiments have been published with a view to determining the most effective shape for the plane.

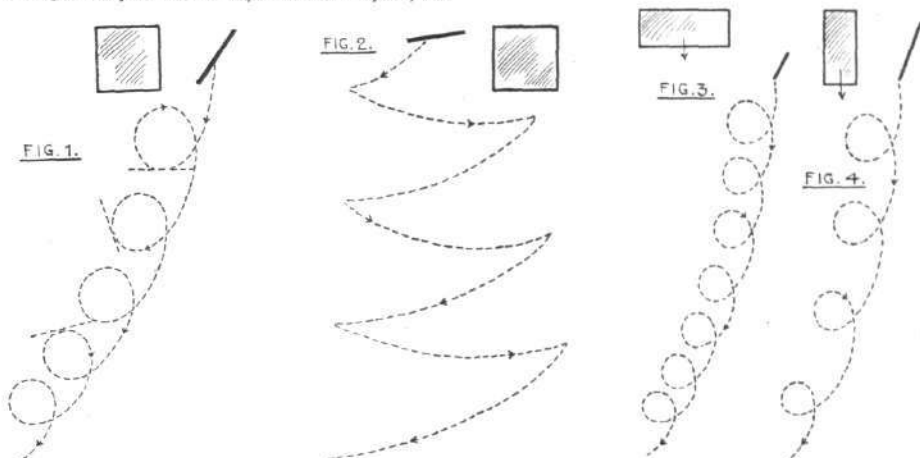
At the present time, with only two successful exceptions, all practicable machines have been constructed on the oblong or pterygoid principle.

Before taking this for granted, and constructing a machine on these lines, the writer decided to investigate the matter thoroughly.

After having carefully studied the subject for several years, and

pterygoid and apteroid aspects. Each gyrated similarly to the above in coming to earth, but the apteroid or end-on aspect showed a distinct tardiness in its tendency to capsize, whilst the pterygoid or broadside-on arrangement revolved with some comparatively greater velocity (Figs. 3 and 4).

This is due partly to the increased length requiring more space to turn in, and partly to the smaller effect of the centre of the centre of pressure when shifted; but it is well known, and was incidentally proved in FLIGHT (May 22nd, 1909) by Lanchester, with the aid of a simple experiment, that a plane flying in pterygoid aspect was more efficient than one flying in apteroid. Therefore if we can manage to obtain the advantages of both without the disadvantages we shall have gained an improvement.



compounded the various theories on the subject, the writer set about to endeavour to discover the most suitable type of plane having, if practicable, both lateral as well as longitudinal stability.

With this object in view several models were constructed all on the monoplane principle; the main planes of these models were constructed having the following shapes:—Square, oblong, triangular, circular, semicircular, and quadrantal.

These were all constructed without a tail, as the object of our experiments is to endeavour to determine a plane which does not require the additional stabilising effect of a tail to keep it in equilibrium. They were all launched at varying angles to the horizontal, with the following results.

The square-shaped model came to earth rotating with increasing velocity in a curve, as shown in Fig. 1, or if sent off nearly horizontal, not attaining sufficient velocity to rotate as before, glided down oscillating from side to side, as shown in Fig. 2.

This is due, of course, to the well-known theory that the centre of pressure moves forward towards the leading edge of the plane, and so capsizes the plane, or tends to.

The next to be tried was the oblong, which was tried in both

Triangular planes were then tried; they were more efficient than the rectangular models, but not to any appreciable degree. Of the remainder, circular gave the same results as the square, and quadrantal practically the same as the triangle, but the semicircular model was a decided improvement on the previous ones. The difficulties attached to constructing anything of a circular nature are obvious; however, further experiments were carried out with the semicircle, and it was eventually tried with the centre part removed. The model then resembled Fig. 5.

The best results obtained from this type were when it was diameter or broadside-on. After several trials a more practical form was evolved, namely, a "V"-shaped model.

This flew with marked stability when flying with open end foremost, but the machine invariably toppled over backwards; thinking that this was due to lack of balance in order to reduce weight, some of the rear edge was removed; the plane then resembled that shown in Fig. 6. However this did not have the desired effect, so that the effective area of the front portion was reduced; it then resembled that shown in Fig. 7. This flew with almost unerring stability, and is really theoretically stable, for as the centre of pressure moves forward both the lateral and longitudinal dimensions of the plane decrease, and so the turning moment of the centre of pressure on the plane remains constant, provided that the dimensions are in the correct proportion. By actual experiment the best results were obtained with an angle between 130° and 140° . Having evolved a plane practically stable as far as longitudinal stability is concerned, the next thing to do is to find out some means of obtaining lateral stability. This was done by constructing the model with an anhedral angle as opposed to the usual dihedral angle. This was not done without a reason, for it will be seen that as the plane heels over the angle of the lower plane is increased, and so causes an increased lift on the lower plane, whilst at the same time the angle of the upper plane is decreased, and brought to a horizontal or downward position, thus causing a downward movement on the part of the wing which had been canted up. This is only true up to a certain angle of list, which is called the danger angle, but is safe enough for ordinary purposes, as it must be recalled that the danger angle of the ordinary steamship lies between 60° and 70° , so that for ordinary purposes it will be automatically stable. A rough idea of the machine as finally evolved is shown in Fig. 8.

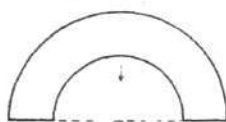


FIG. 5.

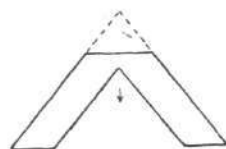


FIG. 6.

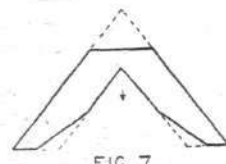


FIG. 7.

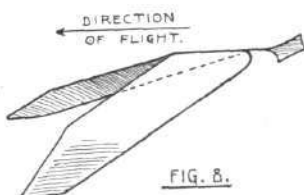
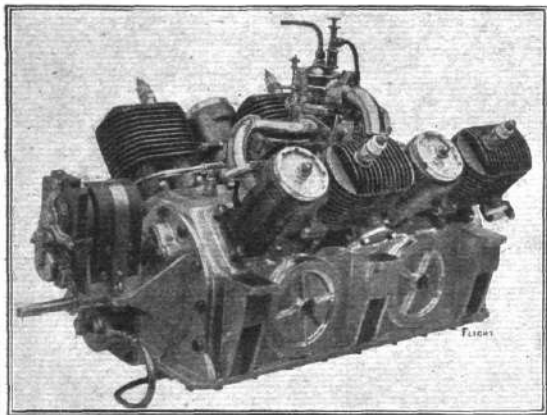


FIG. 8.

LAMPLOUGH "MULTIPLE-COMPOUND" TWO-CYCLE MOTOR.

IN a sense the our cycle has been retained, and is divided up into a "compound" two cycle; that is to say, a combination is arranged of what might be termed a charging and firing couple, the whole



View of Lamplough's "multiple-compound" two-cycle motor.

forming a firing unit. According to the power required any number of units may be used.

It will be noticed by referring to the annexed drawing that the firing units are arranged in pairs, the object being to use the dual piston as an exhaust and inlet valve, that is to say, one piston will uncover the outlet port, which is cut in the cylinder wall slightly in advance of the inlet port, to allow the pressure to escape prior to the uncovering of the inlet port, otherwise the firing pressure would have a tendency to baffle back and fire the incoming mixture. Another advantage of this system of cylinder construction is that it ensures the complete sweeping out of the residual gases, and consequent scavenging of the cylinders.

A duplex method of sliding sleeves for the charging units supplies a positive charge at all working speeds up to 1,500 revolutions per minute. The charging and firing units are practically in one piece, consequently no time is lost in transferring the charge from the intermediate receiver into the firing cylinder. To prevent waste of the charge, as occurs when transference takes place from the crank-chamber, the charging cylinder is made approximately one-third less the volume of the firing cylinders.

The advantages claimed for the system are:—

1. The charge is at all times positive and regular.

2. The scavenging is complete, no burnt gases remaining in the cylinder, enabling a weaker mixture to be used, tending to greater economy and a cooler motor.

3. The cylinders are in multiple and of small size, and can be efficiently air cooled.

4. A four-unit two-cycle motor, as compared with a four-unit four-cycle motor, has double the number of explosions, giving improved torque.

French Pilots' Certificates Called In.

At a meeting of the Commission Sportive Aeronautique it was decided that all pilots' certificates already issued by the Aero Club of France should not be valid after December 13th. It will be necessary to hold the A.E.C.F. certificate to take part in any of the events held under F.A.I. rules in France next year, and aviators who already hold the certificate should therefore apply to the Aero Club of France for a renewal of their licence.

This move has been inspired by the resolution of the Federation that all the representative clubs constituting it should make their certificates uniform.

5. Power for power the compound two-cycle is only half the weight and number of parts, being practically valveless.

6. Silence at all speeds.

7. Greater economy in petrol consumption.

8. As radiators, circulating pumps and piping are dispensed with, compound multiple two-cycle motors are inexpensive, besides being specially suited for aeronautical work.

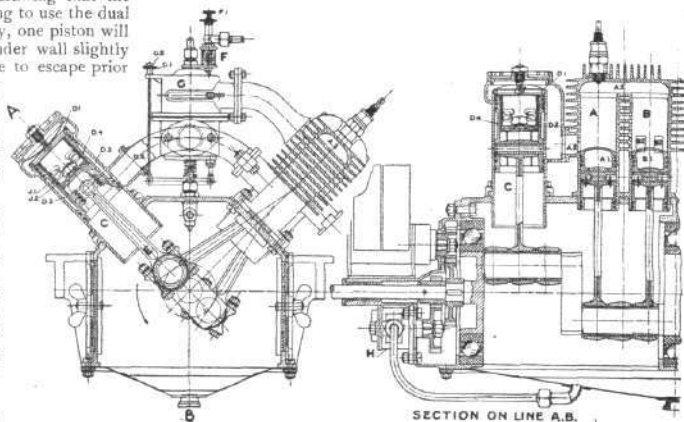
The carbureting is by means of a floatless system, and the cylinder lubrication is effected through the carburettor by means of a forced sight feed.

The general arrangement of the whole is as follows:—

A and B form a firing unit or couple. C is a charging cylinder connected to A and B, where the inlet port, A², is situated.

As the connecting-rod, E, oscillates, the sleeves, J¹ and J², are operated, the outer sleeve, J¹, descending and the inner sleeve, J², rising, this brings the ports (on the down stroke only in the direction of rotation) into line with the ports in annular piston, D⁴, the space, D³, surrounding D⁴ being at all times open to the induction-tube, D⁵, a charge is drawn into the cylinder, and on the return stroke the charge is forced through the diaphragm valve, D¹, into the receiver, D², ready to charge the cylinders A and B.

As the pistons of firing cylinders travel out it will be seen that the exhaust ports, B², are uncovered by piston, B¹, in advance of the inlet ports, A², allowing the exhaust to take place. As piston, A¹, passes over port, A², the charge stored in receiver, D², enters through ports, A², rises through cylinder, A, crosses the combustion space, A³, and passes down through cylinder, B, thus sweeping the residual gases left from the last firing charge out through the exhaust ports, B². As the charging cylinder, C, is approximately two-thirds the combined volume of the firing cylinders, A and B, none of the charge is wasted.



Sectional drawings of the Lamplough multiple-compound two-cycle motor, showing the arrangement of the charging cylinder and the working cylinders.

F is a sight-feed lubricator connected direct to the pump, H; oil for lubricating the charging and firing cylinders passes through the carburettor, G, the amount being regulated by the adjustment, F¹. G¹ adjusts the correct supply of petrol to the motor, and is locked by the nut, G².

The World's Passenger Record.

At last a world's record has been placed to the credit of Germany, for on Sunday last at Mulhouse, Amerigo, in the course of his training with a view to trying to beat the world's duration record, remained in the air for 3 hrs. 19 mins. During this time he was accompanied by a passenger, Lieut. Oppen, and this flight therefore counts as a world's record, which has hitherto stood to the credit of Morane, who flew with a passenger 2h. 2m. 7s. in July last at Rheims. This flight also beats by a few minutes the "official" German duration record of Euler, although Amerigo recently flew for over 4 hours.

BRITISH NOTES OF THE WEEK.

Mr. Grahame-White at Dover.

THE special Bristol biplane ordered by Mr. Grahame-White in order to take part in the competition for the Baron de Forest prize was despatched from the works on Saturday week and was at Dover ready for trial on Wednesday of last week. Owing to the bad weather, however, the first opportunity to make a test only came on Sunday. There was then a lull in the wind and Mr. Maurice Tetard took out the biplane for a final trial before handing it over to Mr. Grahame-White. A gusty wind of a force between 20 and 25 miles an hour was blowing, but the machine showed great stability, and flew steadily at an average height of 100 feet. On landing, some slight adjustments were made and then Mr. Grahame-White made a trip which lasted about ten minutes, during which he went about half as high again as Tetard. A further slight adjustment was made and then several more flights indulged in, but they were all of short duration. At the conclusion of the tests, when the propeller was still turning slowly, a dog ventured too close, and being caught by the propeller was thrown into the air and instantly killed. The propeller was badly damaged, but fortunately another spare one was available on the spot and so Mr. Grahame-White quickly had his machine again in readiness for further work.

Brighton and the £10,000 Prize.

AT last week's meeting of the Brighton Town Council, the question of making Brighton one of the stopping places on the aerial tour round England for the *Daily Mail* £10,000 prize was considered. It was resolved that the local council should co-operate with the Royal Aero Club, and give facilities for the competing airmen to use the racecourse as a landing and jumping-off place at that stage in the tour.

An Opportunity for Encouragement.

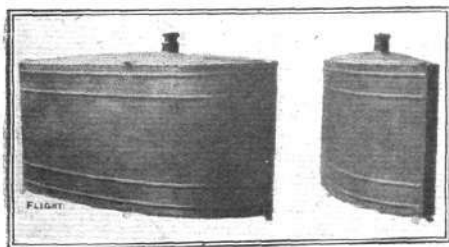
ELSEWHERE in this issue will be found an interesting description of the biplane which has been built and flown by Miss Lilian E. Bland, a young Irish lady. The success which has attended the efforts of this aviatrix is an excellent instance of the good results which accrue from persevering in the face of difficulties, and it provides an admirable opportunity for those who wish to encourage aeronautics and aviation in Great Britain to do some real practical "helping."

British Machines for Abroad.

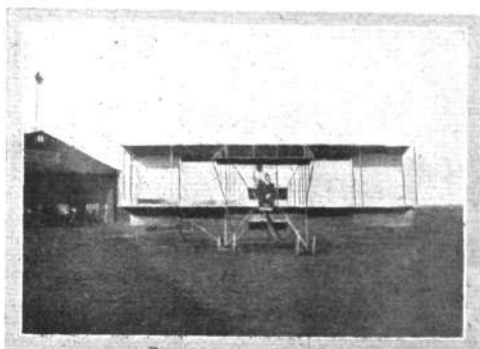
AS a sign that the British industry, even at this early stage, is beginning to make itself felt with its French rivals, it is interesting to note that the well-known Scandinavian aviator Christiaens has ordered two "Bristol" biplanes, one of them to be fitted with a Gnome engine.

An Aeroplane Auction.

PROBABLY for the first time an auction sale of a well-tried aeroplane is announced for to-day (Saturday, December 17th), at Brooklands Racing Track, Weybridge. The circumstances are the



One of the latest aeroplane tanks (40 gallons petrol), by the Spiral Tube Co., just delivered to Mr. Cody to his design. In sending us this photograph, the Spiral Tube and Components Co. write: "As we have supplied Mr. S. F. Cody with radiators, &c., we would say that we did not supply the tank to him of which it was widely reported, last week, that the seam broke away, apparently, on account of the two edges being merely laid together and soldered. All our tanks are so reinforced that such an accident could not have happened to one of our manufacture, as we recognise the extreme seriousness of a leak in mid-air."



A LANE-FARMAN BIPLANE FOR A MAHARAJAH.

--The above machine has been taken out to India by Mr. C. W. Bowles for His Highness the Maharajah of Patiala. Writing from Port Said, en route, Mr. Bowles says: "After taking lessons at Lane's Flying School at Brooklands, I have purchased the above Lane-Farman, with 60-80-h.p. E.N.V. engine, for His Highness the Maharajah of Patiala. The photo was taken at its first trials with myself up in the pilot's seat."

dissolution of partnership in connection with the Avis monoplane, and Messrs. Friswell, Ltd., are the auctioneers, who are instructed to sell under the hammer the entire contents of Hangar No. 9 at Brooklands, including an Avis monoplane fitted with 35-40-h.p. 8-cylinder J.A.P. engine, a 35-h.p. Green 4-cylinder flight engine, and a 25-h.p. Anzani 3-cylinder flight engine.

Materials and Accessories.

A NEW edition of his catalogue being required, Mr. A. Melcombe, of Bedford, has taken advantage of the opportunity to include in it the prices of various fittings for full-sized aeroplanes. Apart from this the catalogue contains very full particulars regarding almost everything which the model aeroplane maker will require, and those of our readers who are interested in this branch of the sport should find the list very useful to keep by them, and a copy will be sent on application to Mr. A. Melcombe.

A Polyglot Technical Dictionary.

MANY attempts have been made by various authors to bring out a satisfactory Polyglot Dictionary, but the majority of these works have been confined to three languages. One of the most ambitious of them, that known as the Deinhart-Schlomann series, published in this country by Messrs. Constable and Co., gives the various equivalents in six languages—English, French, German, Italian, Spanish and Russian. The tenth volume, which we have just received, deals with motor vehicles, and under this heading is included airships and flying machines. The various terms are arranged in groups and wherever possible they are further elucidated by an explanatory sketch. At the end of the book all the terms are included in a general index arranged alphabetically, with the exception of the Russian equivalents which are mercifully given in a separate index. This particular volume of the series has been compiled by Rudolf Urtel, and the edition for the United Kingdom is published with the authority—and to some extent, therefore, under the official auspices—of the Royal Automobile Club. The principal automobile clubs of the other countries have also assisted in correcting the translations of the various terms, so that it may safely be concluded that the information it conveys as to the corresponding meanings of words used in connection with flying machines are as accurate as they possibly can be. The book runs to over 1,000 pages and is published at 12s. net.

Fittings for Aeroplanes.

A VERY useful list of wire strainers, aluminium lugs, eyebolts, shock-absorbers, and other such fittings for aeroplanes has just been issued by Messrs. Whiteman and Moss, and in order to enable customers abroad to order quickly, a special code has been devised. A copy of the list, which gives prices, and full particulars of the various fittings, can be obtained by any of our readers on application.

FROM THE BRITISH FLYING GROUNDS.

Brooklands Aerodrome.

THE centre of interest, of Brooklands aviation, has shifted to the South-East Coast, where the leading Brooklands flying men are located preparatory to attempts to annex the De Forest £4,000 prize. Lieut. Watkins with his Howard Wright biplane at Shorncliffe, Mr. Sopwith with the same make of machine at Eastchurch, Mr. Greswell with a Bristol-Farman and Mr. Grahame-White with a Bristol biplane both at Dover. Altogether a very representative list of sound flyers who may be trusted to hold their own against any from other flying grounds. The odds are, of course, on Mr. Grahame-White with his varied experience and many cross-country flights. Several other airmen at Brooklands are intending to compete, if their machines are ready and "willing," notably Mr. Graham-Gilmour on the Martin-Handasyde. The 40-h.p. Jap on this machine has been replaced by Mr. Gilmour's 35-h.p. Jap from his Blériot "Big Bat." This particular engine, it will be remembered, sustained the "Bat" in flight for over an hour, so has been well tried and not found wanting.

On Sunday Mr. Gilmour took this machine out, making straight flights; the engine appeared to give satisfaction. He had the ground to himself, with the exception of the Bristol-Gnome. With the leading lights away, and with samples of the worst weather we have had for the past year, there is practically no flying to record.



FOREIGN AVIATION NEWS.

Legagneux Beats the Height Record.

AT Pau, after a preliminary trial on the 8th inst., during which he rose to a height of 1,000 metres, Legagneux, on the following day, succeeded in handsomely beating the world's altitude record. Rising from the ground at half-past ten, he remained in the air for 1 hr. 34 mins., during which he rose to a height of 3,200 metres (10,746 ft.). This height was recorded by a barograph on the machine. The descent was made in 16 mins., and on landing the aviator said he found the intense cold very trying, although the sun was shining brightly.

And Also Tries for the Michelin Cup.

ON Tuesday morning Legagneux made a determined attempt on the world's duration record and also tried to secure the leading position in the competition for the Coupe Michelin. He started at half-past eight, but landed after only three turns to make a small adjustment. He restarted at five minutes to nine and kept on flying till half-past one, by which time he had covered 400 kiloms., and beaten Tabuteau's record for that distance. At this stage Legagneux found the increasing wind made his task too arduous and determined to come down. The new record is 4 hrs. 35 mins., as against 5 hrs. 38 mins.

Cross-Country Trip by Captain Bellenger.

LEAVING Vincennes at 20 minutes to 11 on the morning of the 9th inst., Captain Bellenger steered in the direction of Chalons, and arrived there at 10 minutes past 12. During this time a strong wind was blowing, and Captain Bellenger found it expedient to keep at a height of about 1,000 metres.

The Lazare Weiller Prize.

ON the 1st inst., Lieut. Féquant, accompanied by his brother, left the Chalons Camp with the intention of flying to Avesnes and back in an attempt to win the Lazare Weiller Prize. He, however, had not proceeded far when he was forced to land, and, on a restart being made, only got as far as Bray-en-Thierache. There he was forced to remain until the 8th inst., when he set out again, but only reached Rheims, where the chassing of the machine was considerably damaged by a sudden landing. The repairs were executed by the following morning, and then Lieut. Féquant decided to give up the present attempt and fly back to Chalons, which was accomplished safely.

Another Royal Antoinette Pupil.

ALTHOUGH Prince Alphonse of Orleans has completed his training at the Antoinette School at Mourmelon, that establishment is not without a royal pupil, as his cousin, Prince Antoine of Orleans, is now being taught by Gobe. Thomas has now fully recovered from his accident at Milan and is back at Mourmelon, and the other day carried Captain Burke, who has recently learnt to fly at the Farman School, for a trip on his machine. On the 7th inst., Naval Lieut. Lafon made a trip of an hour and a half on his Antoinette monoplane.

M. Ducrocq, on Wednesday, made several circuits, at about 50 ft., on his racing Farman. Mr. England, on the Hanriot, was indulging in hops and short straight flights, whilst Mr. Law, on the Bristol-E.N.V., was also trying some straight trips, but the engine was pulling badly. M. Blondeau was carrying a passenger; but his Gnome engine was obstinate, and he was unable to negotiate the turns, so we had the unusual sight of M. Blondeau making straight flights.

London Aerodrome.

OWING to the weather, there is very little of interest to record of the past week's doings. On December 6th Mr. Clutterbuck had out the Everett monoplane, but the engine was still working unsatisfactorily, and the machine did not rise, although most of the weight was clearly off the wheels. Next day, however, the engine did for a short time come to a sense of its duty, with the result that the machine took a 40-yd. hop. Then the engine again failing, it came to earth, and being caught by a gust of wind, went over on to one wing and damaged one landing wheel. The Papin monoplane was outside tuning up, but retired again, as the engine was working somewhat erratically. In spite of the deluge of rain to which it has been subjected, the ground keeps tolerably hard and dry, the drainage system fortunately having exceeded the anticipations even of those who planned it.

New Breguet Machines.

A NEW biplane has been built by M. Breguet, specially with a view to speed, and some trials were carried out with it last week at Douai. Although a very stiff breeze was blowing the machine proved itself to be wonderfully stable, and a good speed was maintained during a quarter of an hour's trip, with M. Breguet at the helm. A new pupil of great promise at the Breguet School is Legrand, who, at his second trial, made a fine flight, circling over the outskirts of the aerodrome.

A Caudron Biplane at Issy.

A VERY interesting trial was made with a Caudron biplane at Issy on the 6th inst. This machine is fitted with a 5-cyl. Anzani motor, and it circled round the aerodrome twenty times at a height of about 80 metres.

The Sommer School at Douzy.

LAST week Sommer and Lindpaintner were busy at Mouzon testing a new military biplane. On the 9th inst. Lindpaintner flew for an hour, carrying a load of 260 kilogs., his altitude varying between 300 and 500 metres during the trip. Noel, who some time ago learnt to fly a Voisin machine, is now practising on a Sommer biplane, and last Saturday made the necessary tests to secure his pilot's certificate.

Direction Signs for Aviators.

IN connection with the proposal of the Ligue Internationale Aérienne to lay down signs for aviators, in the form of large figures, a series of tests are to be made at Chalons by Capt. Marconnet. The numbers will be secretly placed in close proximity to the various villages round the camp, and the various officers will endeavour to locate them and report upon their observation of them at different heights. At the same time tests will be carried out with a view to discovering the best combination of colours and the most efficient position for the signs.

Weymann Changes His Mount.

WEYMAN still has the intention of making another attempt to fly from Paris to Brussels and back, but it is not improbable that his next trial will be with a monoplane. He has just purchased a Nieuport machine fitted with a Gnome engine, and the preliminary tests have shown this combination to be a very fast one. He anticipates that he will be able to make the journey from Issy to Etterbeck in two hours and a half.

A Military School for Peru.

TAKING with him five new Voisin machines, and accompanied by Chailley, Bielovucic left France on Saturday on the s.s. "Normandie" for Peru, whither he is going in order to complete an arrangement with the Peruvian Government and establish a military school of aviation.

More American Speed Records!

FOLLOWING on the remarkable speed records which it is claimed Hamilton made last week, a further cable from America states that Menthis Barrier, a member of the Moisant team, covered 23 kiloms. at a speed of 87 miles an hour, or 140 kiloms. We await with interest official confirmation and time of this and also of Hamilton's record-making flights.

Doings at Johannisthal.

ORVILLE WRIGHT was at the Johannisthal flying ground on the 6th inst., and made a flight of several circuits of the aerodrome at a height of 150 metres. On the following day Brunnhuber repeated his exploit of taking four passengers with him on his Farman machine for two circuits of the ground, while Capt. Engelhardt, on a new Wright biplane, made a cross-country flight at a height of 300 metres, passing over Glienicke, Schoenefeld, Eichwalde, Gruenau, to Aldershof and back.

It is a rather curious coincidence that two of the aviators at Johannisthal should have met with trouble through losing their propellers last week-end. On Saturday afternoon Brunnhuber was flying on his German-built Farman at a height of 50 metres when the propeller dropped off, but the aviator was able to land safely and without damage. Two days later Thelen was giving a passenger a trip on his Wright biplane when the starboard propeller fell off. The machine dropped suddenly from a height of six metres to the ground and although Thelen himself was unhurt, the passenger was rather severely shaken up, while the machine was smashed.

Some very interesting figures have just been published regarding the flying at Johannisthal during the month of November. It appears that in the aggregate 287 flights were made, and the total duration of the flying was 56 hours. The largest proportion of this was to the credit of Capt. Engelhardt, who made 81 flights, and was in the air for 18 hrs. 56 mins. He was followed by Meisner, who made 65 trips.

Last week a deputation of Russian military officers paid a visit to the Johannisthal Flying Ground, where they were especially interested in the Albatross Works, which builds Farman biplanes in Germany. It is rumoured that the Russian Government intend to order a number of aeroplanes from this firm.

An All-Austrian Biplane.

A NOVEL biplane has just been designed by Herr Lohner, the well-known Austrian engineer, and in general appearance the machine looks like an Antoinette body, with its usual tail, mounted on a Farman biplane, with the lower planes shorter than the upper ones and the upper ones fitted with ailerons. In plan, however, it

is seen that the main planes are not rectangular, but placed in the form of a very obtuse V. The tractor, which is placed in front of the machine, has also been designed by Herr Lohner, and as the machine is fitted with a 60-65-h.p. Austrian-Daimler aero motor it is an entirely Austrian production. The machine will be tested shortly by Capt. Umlauf, an Austrian cavalry officer.



AIRSHIP NEWS.

The Naval Airship.

ACCORDING to advices from Barrow, the work of erecting the naval airship has now been completed, and as soon as the weather takes a favourable turn the great dirigible will be brought out of her shed and put through various trials. It will be remembered that this airship, which is of the rigid type, is over 400 ft. long, the total lifting capacity being about 22 tons. It is anticipated that the speed will work out to about 40 miles an hour.

A New Austrian Dirigible.

IN addition to the Lebaudy and Parseval airships which now compose the aeronautic establishment of the Austrian Army there will shortly be at their disposal a third airship. This will be constructed on what is known as the Koerting system. The gas-bag will be 65 metres in length and have a capacity of 3,600 cubic metres. Two motors, each of 75-h.p., will provide the power for the two four-bladed propellers which will be fitted. The car will be arranged to accommodate eight persons and a new type wireless telegraphy apparatus is to be installed.

Military Airship Over Venice.

ALTHOUGH a mist enveloped the city on Saturday last, the Italian military dirigible No. 2 was taken from its shed at Canbalto, and cruised over the city of Venice for some time.

Russian Government and a Second Zodiac.

AFTER a satisfactory voyage of three hours, during which a speed of 45 kiloms. an hour was obtained, the Russian Government, on December 9th, formally took over their second Zodiac dirigible known as "Zodiac IX." During the afternoon of the same day a Russian crew, composed of Capt. Nigivesky and Lieut. Bolsouovskiy and the mechanic Naoumoff, took the airship out for a short journey under the supervision of Count De la Vaulx, and cruised over the Fort of Brest-Litovsk and over the Parade Ground, where the troops were being reviewed on the occasion of the Fête of St. George.



CORRESPONDENCE.

. The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents communicating with regard to letters which they have read in **FLIGHT**, would much facilitate ready reference by quoting the number of each such letter.

NOTE.—Owing to the great mass of valuable and interesting correspondence which we receive, immediate publication is impossible, but each letter will appear practically in sequence and at the earliest possible moment.

AERIAL BRAKE.

[954] I read of many interesting things in your paper, but have never come across any device that actually serves as a brake on an aerial machine while in flight.

On many of the present aeroplanes this would be unnecessary, but when there are a number of them together, as at a flying meeting, an air-brake would be a valuable accessory, and might avert serious collisions.

Leicester.

AERIAN.

"C.G. AND L.C.P."

[955] In answer to Mr. le Maître's letter (895) I feel inclined to agree with him as an advocate of a low centre of gravity, as far as straight flying is concerned. But at the same time I contend that a low c.g. is disadvantageous when turning. To those unacquainted with the practical side of flying this theory of the action of centrifugal force at corners may influence them a great deal, but unfortunately, in practice it seems to be a non-existent quantity. Take, for instance, the "White Eagle," which Grahame-White discarded long ago. It had a low c.g., and since then Blériot has forsaken that type. Also, it is acknowledged that the Antoinette

machine is slow at manoeuvring, even in Latham's capable hands, while the old R.E.P., with its high c.g., was remarkably quick on turning. But the latter type was very unstable, and the maker of it has at last thought fit to bring the weight lower down—with apparently good results. Note the performances of Pierre Marie and Laurens recently. The above facts seem to suggest that the ultimate position of the c.g. will be neither above nor below the centre of pressure, but lying in the same plane. Or perhaps the weight will be arranged whereby it may be raised or lowered at will by the pilot. I do not see why this idea should not be used successfully on any present day machine.

Coventry.

"ASPIRING."

GRAPHICALLY RECORDING ALTITUDES.

[956] Referring to the article "How the Altitude of an Aeroplane is Measured," which appeared in the October 1st issue of **FLIGHT**, a description follows of a few suggestions for eliminating the difficulties described in that article. The first is that a theodolite used for this purpose should be fitted with a recording device. This might take the form of a travelling paper ribbon controlled by a time-piece. Secondly, a number of theodolites could be used, say four, placed in the form of a square, if possible, with a mark-post in the centre of the flying ground exactly central to the square. Before commencing the time-pieces on the theodolites would be set exactly alike. When each theodolite was in position it would first be centred on the mark-post and its pointer adjusted to the zero line on the paper ribbon. To each side of this line would be a series of parallel lines indicating degrees. When the theodolite was in use an exact record would be traced on the ribbon showing the angle of deflection of the theodolite to either side of the zero

line, also the time would be automatically marked along the ribbon. Another paper ribbon could be used to record the vertical angles, or one ribbon might be used for both records. After the trial the ribbons would be compared. It would be easy to see at about what time the aeroplane was highest and make calculations to find the highest point and the exact height in feet. I have no doubt a machine could be made through which the records could be run in pairs, while four operators would each follow one of the traced lines with a tracing point. The movements of these points would operate mechanism which would make the necessary allowances for all the factors, and cause another tracing-point to trace an altitude curve on another ribbon which would have the same time-graduations as the others. The four records would give six different combinations, consequently there would be six time and altitude curves. These could be made on very thin transparent paper, so that they could be superposed and another curve traced by hand on a seventh ribbon, which curve would be the mean of the six. If a cloud obscured the aeroplane from one observer, he would throw his tracing-points out of action until it appeared again. If the aeroplane was in sight of two or more of the observers all the time, a complete record could be made. If adjustment of the theodolite by screw was too slow, two long sensitive handles might be used instead. Theodolites are intended more particularly for sighting stationary objects, so, naturally, they should be adapted somewhat for moving objects. In conclusion, this method of obtaining altitudes would only necessitate the employment of four moderately good observers, or four pairs in case of very long tests, and there would be no critical point, as the observations would be continuous. Perhaps some enterprising flying-ground manager will take the matter up, and see what can be done along these lines.

Bradford.

HAROLD SMITH.

TO ENCOURAGE THE NON-PROFESSIONAL.

[957] As an onlooker, and so one of those who proverbially see most of the game, may I be permitted to put forward a few remarks on the subject of the *Daily Mail* £10,000 prize to be competed for next year.

The Royal Aero Club are, it is understood, now engaged in drawing up the conditions for the contest, and some such arrangement as I here venture to suggest may be included in their scheme, but in any case I cannot but feel that it is impossible to say too much on the matter, or to say it too strongly.

In reading accounts of flying meetings and competitions one cannot help noticing the fact that the majority of the prizes have been carried off, not essentially by the best aviator or the best aeroplane, but to the firm with the best organisation and large capital.

Now, as things stand at present, the *Daily Mail* £10,000 is likely to go the same way, and it seems to me that this is hardly just. A prize of this kind, which is indeed a magnificent one, should surely be awarded to the best aeroplane piloted by the best man, an award which would do far more to help on the cause of aviation than if it went to swell the coffers of an already prosperous firm without any due regard to real merit. It is surely not a difficult thing to carry off prizes if one has a spare machine, unlimited spare parts and skilled mechanics posted at every stage of the journey, all of which is easy to arrange for with a big firm at one's back, but the private aviator, who may be quite as good if not a better man and even have a more all-round satisfactory machine, is altogether too severely handicapped against such competition.

What I propose, put briefly, is this. That every aviator entering for the prize should do so entirely without outside assistance of any sort whatever. If he is able to carry spare parts on his machine well and good, but the flight should be made by his own unaided efforts and on the same machine. In this way all who entered would stand an even chance, and it would be, as I said before, the best man on the best machine who would win.

I do not think a condition of this kind could be considered too drastic in respect to the magnitude of the prize offered and the present advance in aviation. I therefore beg to submit my humble opinion to the consideration of those in authority.

Mr. Moore-Brabazon, in his letter to your paper of August 13th, emphatically states that he is giving up aviation for the time being solely on account of this unfair competition of the private individual against the organisation and capital of large firms, and I think he is not the only one who will agree with me whole-heartedly on this point.

I trust you will be able to find room for these few remarks, and accept my apologies for the length of this letter.

Beccles.

DOROTHY M. HAWARD.

TWO-STROKE MOTORS.

[958] I shall be pleased if any reader will criticise the radial two-stroke motor described below. It consists of four pairs of

cylinders in which each pair consists of two cylinders set at an angle to each other, joined by a common combustion-chamber, the eight pistons being connected to one crank-pin.

The cylinders have the usual ports, exhaust in one, inlet in the other; also to allow any oil to escape which may leak by the pistons, a small exhaust-valve is placed in cylinder-head, worked direct from crank-shaft (no gears).

The combustible charge is forced direct into cylinders by a type of turbine blower driven by the motor. Lubrication, pressure feed to the connecting-rod big-end, and the leak feeds the pistons.

Several variations of the above I have in mind. With two cranks at 180°, the base can be used for compressing the gas charge. The two cylinders forming a pair can be set parallel to each other, but the valve action of the pistons is not so good.

Acton.

TWO-STROKE.

CLASSIFICATION OF AEROPLANES.

[959] This subject, if one aims at getting a different formula for each make of plane, is not easy. My system slightly altered should be satisfactory, by adopting two fresh symbols, B for balancers and F for flaps (instead of fuselage as previously given, and which is already represented by a dash). Balancers are paired elevators separate from other planes, and flaps better describes the elevators fixed at the ends of other planes, as in the Goupy, than does ailerons, though you, Sir, so describe them in this machine on p. 882. Ailerons are then affixed only. The Goupy thus becomes P2F₁-H₂F₁R or UPM(SSF₁)C-(HFF₁)VR. The Cody (1910): B₁-UC₂(2B₂)MP-(HR). "Neale VII": E-C₂R-2A,MP-HA.

Brackets are useful, and probably adopted from Mr. Haines. The other two I only suggest, as they are not from good illustrations, and I have not seen them.

Breguet biplane: UPM(SH)C-(RE) Old Voisin: B₂-2V₁P-H₂R₂. Of course these can be shortened. Type would even be: P2-T, B-2BP-T, E-R2P-T, PSH-T, and B-2VP-T respectively.

U deserves more importance than I gave it, and may be placed to represent the position of the front part of the undercarriage.

After the figures representing the sizes of planes, &c., in a fuller specification, the @ may introduce the distance from the front of the previous member of the plane mentioned.

A heavy faced type is better than ordinary for these symbols, and perhaps you could print again the parts I use: Sustaining, Horizontal, Vertical planes, Elevator, Balancer, Aileron, Flap, Rudder, Chair, Motor, Propeller, Undercarriage, Tail, Length (total), Weight, and — for framework or fuselage.

I apologise for the length of this letter.

Burton-on-Trent.

C. J. ROBINSON.

CYCLOPLANE.

[960] We are making a cycloplane, the span of which is 20 ft. and the length 20 ft. Could any readers of FLIGHT give me plans for a simple elevating plane? Also how wide should the main planes be to carry a boy of 6 or 7 stone?

Wimbledon.

G. TUCKER AND CO.

PROBLEM OF THE HELICOPTER.

[961] In the November 26th number of FLIGHT, on page 976, you state that $E = \frac{1,100}{V}$.

I do not understand how you obtain this, as it appears to me that the work done in the slip-stream = TV ft.-lbs. per sec., i.e., TV60 ft.-lbs. per min.

$$\therefore \text{the h.p. in the slip-stream} = P = \frac{TV60}{33,000} = \frac{TV}{550}$$

$$\therefore E = \frac{T}{P} = \frac{T550}{TV} = \frac{550}{V}$$

I shall be much obliged if you will explain where my calculation is at fault.

Wealdstone.

PUZZLED.

[The above calculations err in the assumption that the energy in the slip-stream is TV: it is $\frac{1}{2}$ TV.]

The complete derivation of the formula for thrust is

$$T = mf = mV = \frac{\rho}{g} AV^2 = \frac{AV^3}{400} = \frac{D^3V^3}{535}$$

The derivation of the formula for power in slip-stream is

$$\text{Energy (ft.-lbs./sec.)} = \frac{1}{2}mV^2 = \frac{1}{2}\frac{\rho}{g}AVV^2 = \frac{AV^3}{800}$$

$$\therefore \text{Power (h.p.)} = \frac{D^3V^3}{587,000}$$

$$\text{Whence } E = \frac{T}{P} = \frac{1,100}{V} \text{—ED.]}$$

MAN CARRYING GLIDER.

[962] Would you kindly answer the following questions:—
1. What is the proper thickness for the main spars of a glider 28 ft. span? 2. Is it possible to glide in calm air? 3. Is a slope of 1 in 10 suitable for a glider? 4. Would an angle of 5° be too small for the planes of a glider?

Bruton.

B. R. WOODWARD.

[1. About 1 in. x 1½ in. in section ought to be suitable. 2 and 4. It is possible, but would be difficult, to acquire the necessary velocity without special apparatus and it tends to increase the danger of early experiments because in the event of contact with the ground the damage is more or less likely to be in proportion to the momentum, which is a function of the speed of the machine over the ground. The Brothers Wright made all their early glides at quite slow speeds over the ground, gliding in a head wind that made up the necessary velocity through the air. It is also unsafe to attempt preliminary experiments in a very strong wind, owing to its gustiness, and it is for this reason that a glider should be designed with as low a loading as possible, in the order of from ½ to ¾ lb. per sq. ft. The lower value would be provided by a 5° plane at between 30 and 40 m.p.h., which is too high for initial experiments. The higher value would be provided by an angle of 20° at between 20 and 30 m.p.h., which is a much more reasonable velocity to form the basis of preliminary experiments, as it implies that the head wind will not ordinarily exceed about 20 m.p.h.]

3. The slope of a suitable gliding hill should be about 10°, or, say, 1 in 5. In order to glide over a slope of 1 in 10 the coefficient of flight would have to be very low; in other words, the angle of the planes would need to approximate more closely to that of least resistance, which, for the reasons stated above, is scarcely practicable in gliding experiments. Moreover, the presence of body resistance, which includes the pilot, struts and other framework of the machine, introduces a supplementary factor that renders it impossible to realise in practice the gliding angles that could be theoretically obtained from the planes themselves. The value of a gliding-angle represented by a slope of 1 in 10 is not the limit, as shown by the curves published in our article entitled "Can We Fly Faster for Less Power?" but it certainly represents a very efficient practical value, which would not readily be improved.—Ed.]

LIFTING BY DEPUTY.

[963] Seeing the photo. in FLIGHT of the staging erected for Mr. Ely's flight from a ship, I suggest that a much better way to start the aeroplane would be to place the machine on an endless platform similar to those used in "The Whip" for the horses to race on. My idea is that when the engine is started up it would cause the machine to get its flying speed without any run at all. This would also do away with all the men who have to hang on the machine. I hope I have made my idea clear to you.

New Cross.

E. W. FARR.

[The above idea shows a lack of appreciation of the fundamental principle of flight, which essentially demands that there shall be relative motion between the planes and the air. A machine can fly perfectly and yet stand still so far as the ground is concerned, this state being commonly known as soaring. If the revolving platform carried the atmosphere with it *en bloc* the suggestion would possibly be feasible, but the atmosphere would in practice only be disturbed to a very small extent and the machine itself would certainly stay *in situ* assuming that it did not also revolve.]

London audiences were regaled, some little time ago, with the spectacle of an "aviator" on a motor bicycle fitted with wings soaring above a revolving platform of the kind suggested. Unfortunately for the pilot, the soaring was accomplished by a rope; we say unfortunately because on the only occasion when we witnessed this not even amusing exhibition, the man and his machine very nearly came to grief when they once more tried to make connection with "terra infirma."—Ed.]

SPEED ALARM COMPETITION.

[964] Judging from the remarks of some of the competitors and correspondents regarding the above, there seems to be some confusion existing as to the purpose to be served by the devices entered.

The competition was instituted, as I understand, in response to the need indicated by Captain Dickson for some contrivance which would warn a pilot when speed through the air had risen in excess of what was contemplated by the designer of the machine. It is not required that the alarm should indicate speed over the ground, which purpose could be much better served by something in the form of the Wimperis accelerometer.

Moseley.

G. J. BOOCOCK.

MODELS.

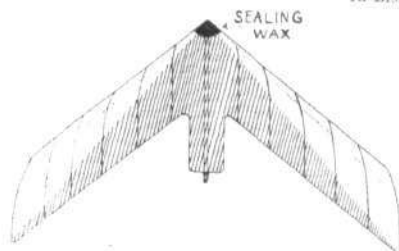
Æ MINIAURE MODELS.

[965] Reading in FLIGHT a letter (948) from Mr. Baxter, in which he states that he has made the smallest aeroplane which he has yet seen, I should be very much obliged if Mr. Baxter would give in FLIGHT full particulars of material, &c.

Concerning letter 945, in which "Glider" says "cut a piece of paper to the shape shown in the sketch," as the sketch is not given I presume it has been left out by a printer's error.* If it occurred in some previous issue, I should be much obliged if you would tell in which one.

Ealing.

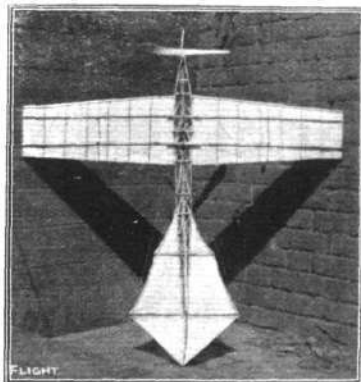
R. BISSHOP.



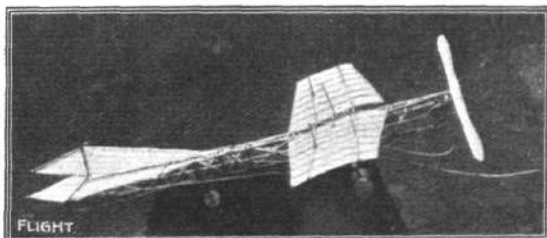
* Gulls' Tails.—The above is an illustration which should have accompanied the letter above the signature of "Glider" on page 1020 in last week's FLIGHT.

MODEL CONSTRUCTION.

[966] Please find enclosed several photos of a model Antoinette monoplane, scale 1 in. to 1 ft. It has occupied most of my spare time for the past few weeks, but has been a labour of love. At first



I tried to originate, but the machines I made were not successful. I have learnt a great deal from the making of the scale model, and



now feel more ready and fit to commence working out ideas of my own. The scale drawings I obtained from your Journal.

The following measurements may be helpful to readers: Propeller, 14 ins., driven by 28 strands of ⅛-in. elastic 40 ins. long; planes

span, 48 ins., width where they join body 10 ins., tapering to 7 ins. at tips; tail plane, 15 ins. wide, 18 ins. long; elevator, 6 ins. long; length overall, 44 ins.

The tail is slightly bigger than the given scale measurements, as I find this helps lateral stability.

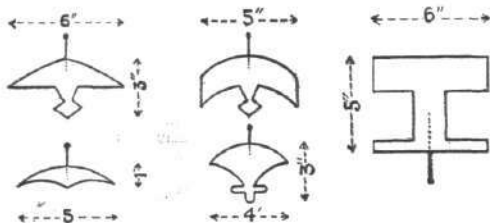
Sincerely hoping you will find space to record my humble efforts in your splendid paper.

Luton.

H. MANN.

PAPER GLIDERS, A HEAVY WEIGHT MODEL, AND A MODEL CLUB FOR KINGSTON AND DISTRICT.

[967] Might I take up a few lines of your most valuable paper with regard to the above heading. I have been experimenting with paper gliders now and then in my spare time for above a year, and I am sure they have proved most interesting and instructive to me. My best glides have been obtained by causing my gliders to circle round when there is a light breeze blowing. My latest glider went no less than some 70 or 80 yards in this way, at the same time rising about 20 yards in height. I am enclosing a small sketch of this little beauty, together with several more of my most successful designs, all of which have an average gliding angle when in trim of



one in fifteen. I find that a good method of weighting them is with a heavy pin, for one can thus adjust the weight by slipping it backwards and forwards, and I think this method is far better than using sealing wax or plastiline.

I have now made about sixty small model aeroplanes, chiefly for experimental purposes. Some of these have worked out at 1½ lbs. to the square foot when not loaded. One of these carried besides itself a weight of about three ounces; the span and length of this model was but 23 ins., while the surface amounted to 50 square inches. When fully loaded this model did a flight of 40 yards.

Myself and my friend, A. H. Weeks, have lately started a model club, especially for boys, in this district, and would all those interested kindly send me a post-card. Wishing every success to your most excellent paper, which has often proved useful to me.

C. MENZIES, Hon. Sec.

36, Cromwell Road, Kingston-on-Thames.

THE DUNN MODEL.

[968] Replying to letter No. 809 of Mr. Goudie. I obtained the elastic and ball-bearing thrust from A. W. Gamage and Co. The fabric can be had at any linen-draper's. The small screw-eyes came from T. W. K. Clarke and Co. The wood and nails I got from "Hobbies, Ltd.," and the size and varnish can be had from any oil-shop.

Camberwell.

HENRY W. DUNN.

CAMBERING PLANES.

[969] Perhaps some of your readers have found some difficulty in cambering their models' planes.

I found the following way answered well:—

Get some ordinary model-making cane and cut into strips the required length. Having done this, split them down the middle and steam them into the desired camber. Then they can be stuck on to the spars of the plane and the fabric pasted over. It is best to tie them into position after steaming, and leave them until stiff; the string can then be taken off.

Birmingham.

R. G. PINNOCK.

PUBLICATIONS RECEIVED.

Deinhardt-Schlomann Series of Technical Dictionaries in Six Languages. Vol. X. Motor Vehicles, Flying Machines, &c. Edited by Rudolf Urtel. London: Constable and Co., Ltd. Price 12s. net.

Jahrbuch Luftschiffahrt, 1911. Compiled by Ansbert Vorreiter. Munich: J. F. Lehmanns Verlag.

RECORDS.

Distance and Duration.—Maurice Tabuteau (France), at Etampes, on a Maurice Farman biplane fitted with Renault motor: 465 kiloms. (290 miles) in 6h. 1m. 35s.

Altitude.—G. Legagneux, at Pau, on a Blériot monoplane with Gnome motor: 3,200 metres (10,746 ft.).

Speed.—A. Leblanc (France), on a Blériot monoplane, fitted with Gnome motor, 5 kiloms. in 2 mins. 45½ secs. = 108 k.p.h. (67½ m.p.h.).

Straight Line (not recognised by F.A.I.).—J. Radley (Great Britain), at Lanark, on a Blériot monoplane with Gnome engine: 1 mile in 47½ secs. = 75.95 m.p.h.



Aeronautical Patents Published.

Applied for in 1909.

Published December 15th, 1910.

26,674. J. W. SEDDON. Aerial machines.

27,490. F. MICHAU. Flying machines.

28,382. H. O. DUNCAN AND H. VASSEUR. Parachute attachment for aerial machines.

Applied for in 1910.

Published December 15th, 1910.

37,732. J. J. SLAVIN. Airships.

14,688. BARON A. RORRNE. Airship.

92,920. H. FARMAN. Aeroplanes.

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